

PRICE, 25 CENTS.

A HISTORY

OF THE

Pennsylvania

STEEL WORKS,

LOCATED AT

Baldwin Penna. R. R. Station,

DAUPHIN CO., PA.,

From Their Origin to the Present Time.

ALSO A DESCRIPTION OF THE PROCESS OF MANUFACTURING BESSEMER
AND SIEMENS (OPEN HEARTH) STEEL RAILS, CROSSINGS, FROGS,
SWITCHES, STEEL FORGINGS, BLOOMS, BARS, ETC.

ALSO A BRIEF HISTORY OF THE TOWN, ITS BUSINESS, &c.

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STEEL WORKS, PA.:

"WEEKLY ITEM" BOOK AND JOB OFFICE.
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A HISTORY OF THE Penna. Steel Works.

In sight of the State Capital, but a short distance East, adjoining the city limits of Harrisburg, is situated on the right bank of the Susquehanna river, the enterprising town of *Baldwin. It derives its importance from its relation to the mammoth industrial interests which are centered here. The place has grown so rapidly that it has already attained to a large commercial importance. It has maintained a steady growth from its inception to the present time, and has been unaffected by the terrible wasting influences which have spread their blight over so many towns which were bidding fair to run a career of unrivaled prosperity. We purpose, for the benefit of those who are ignorant of its origin, to write up in a brief space the history of this town. This is an easier task now than it will be in years to come, when those who now form so large a part of its incidents shall have passed off from the theater of earthly action. To the Pennsylvania Steel Company must be ascribed the honor of founding this town. It is appropriate, therefore, that in the start we should deal largely with iron, and the process by which it is converted into steel.

It is well known that iron is not found pure in its native state. It is found combined with various minerals. Iron is found in many parts of this country, and there are other lands which are very rich in their iron deposits. The ability to use iron indicates an approach to civilization. The ages of the world have been marked off by its use of metals. Thus we have the rudest—the Stone Age, the Iron Age,

the Bronze Age, and the Silver Age. Perhaps the period in which we live may yet be called the Steel Age.

There is an abundance of iron ore distributed over the surface of the globe. The chief kinds are magnetic iron ore; red hæmatite, specular or brown iron ore; brown hæmatite, or brown iron ore, and carbonate of iron, including spathic ore, clay ironstone and black band ironstone.

The ore richest in the metal is the *Magnetic, or black Oxide of Iron*. When pure it contains nothing but oxygen and iron, and yields 73 per cent. of iron by weight. It occurs in dark, heavy masses or black crystals, and is found in the older primary rocks. Sweden is famous for this ore. The celebrated mines of Dannamora in that country have been worked constantly since the fifteenth century. It is found in large quantities in the Ural mountains in Russia. It exists also in Canada. It is found in Virginia, New Jersey, and Pennsylvania. The rock formation in which magnetic ore occurs contains no coal, hence it is almost always smelted with wood charcoal, which, as it contains no sulphur, is one great cause of the superiority of the iron produced from it.

Red hæmatite contains more oxygen. It yields 70 per cent. of iron by weight. There are several varieties. *Specular iron* is named from its bright metallic lustre, and is found in large crystalline masses in the island of Elba, where it has been worked for more than two thousand years. It is of steel-gray color, assuming a red tint when in fragments, or when scratched.

*Has since been named Steelton

The *Kidney* ore is of singular origin. Its characteristic form is in large kidney-shaped nodules, with a fine radiated structure. Red hæmatite is sometimes called blowstone. This valuable ore is found in many countries, but, nowhere in greater abundance than at White Haven and Ulverstone, in the northwest of England, where masses of it occur fifteen, thirty, and even sixty feet in thickness.

Brown Hæmatite is a hydrated peroxide of iron, and is like the red hæmatite, and it contains 14 per cent. of water. One variety is called pea iron ore. When mixed with earth or clay it forms yellow ochre and brown umber, so largely used as pigment.

Bog iron ore is a variety of brown hæmatite, usually containing phosphorus, which occurs in marshy districts of recent formation.

Carbonate of iron, when found in a comparatively pure and crystalized state, is known as spathic, spathore or sparry iron, ore, but when impure or earthy, as clay ironstone and blackband ironstone, Spathic ore forms mountain masses in various parts of Russia and Austria, and is now much in demand to yield the spiegleizen required in the Bessemer process. In its purest form it contains 48 per cent. of iron, and in color it varies from buff to dark brown, some specimens taking a beautiful polish and looking like marble. (See v., pp. 633-4.)

The early process of making steel is most probably about identical with that in use in India, and which has not varied since the time of Alexander the Great. It is supposed that the use of steel was known to the Egyptians, and that in their pictorial writings, as in the pictures decorating the tomb of Rameses III, the articles colored blue were intended to represent the butchers, and were represented sharpening their knives upon what are supposed to be steel sharpeners. In Jeremiah, xv, 12, occurs the sentence, "Shall iron break the northern iron and the steel?" The term here is supposed to refer to the steel made in Chalybia, in Asia Minor,

whose iron works were so extensive as to give the name of iron among the Greeks, from whom we have now the term "chalybeate" as applied to mineral springs containing iron. Several expressions in Grecian authors are supposed to refer to steel. Homer compares the hissing made by the glowing stick which Ulysses thrust into the eyes of the Cyclops to that made by a heated iron bar thrust by the smith into the water. Yet no articles of steel have been found among the remains left us by the nations antiquity, even down to the period of the Roman empire.

Steel has been defined as any kind of iron which when heated to redness, and suddenly cooled by being plunged into cold water becomes harder. Every kind of malleable or flexible iron which can be hardened by that process is a steel.

"The difference between cast-steel and bar-steel is due simply to the mechanical effects produced by the hammering necessary in drawing it out. In order to produce this effect, blistered steel is broken into pieces, melted down, then tempered, broken again and the pieces welded together at a good welding heat. By this process the steel is more malleable, its texture more homogeneous, tenacious and uniform, and it will have these qualities in proportion to the number of times it has been subjected to this process. Steel so worked is called 'wrought or shear steel.'

"A great many attempts have been made to discover a process for the production of steel at a less rate than its usual cost. A patent was given to Mr. Josiah M. Heath, in 1838, which consisted in adding one per cent. or less of carburet of manganese to the melting pot. Thus an improvement was made. Sheffield cutlery was reduced more than one-third in cost of manufacture.

"There have been many attempts to produce steel by decarbonizing cast-iron. The most successful of these is that known as the Bessemer process, so named from its inventor. Mr. Harry Bessemer." (The great industries of the United States, 8vo, Article on Steel, pp 931-8.)

Mr. Bessemer obtained his patent in 1856. It is still somewhat imperfect. It

requires the use of some of the good charcoal pig iron like the Swedish. In America a peculiar kind of iron of known composition called speigeleisen is used as a substitute. The word signifies looking-glass, and is so called from the bright appearance of the iron. It is imported into this country and is very valuable.

In the Bessemer process as at present conducted, the pig iron is melted either in a cupola or reverberatory furnace, and run in a liquid state into a converting vessel. This converter or kettle (called also vessel) is of wrought iron, lined either with fire brick or with a silicious material called "ganister," and is suspended in trunnions, so as to admit of its being turned from an upright to a horizontal position, by means of hydraulic apparatus. The capacity of a converter varies from three to ten tons. In the bottom there are seven tuyeres, each with seven holes of one-half inch in diameter, through which atmospheric air is blown with a pressure of from 15 to 20 pounds per square inch by a blowing engine. The molten iron in the converter is therefore resting, from the first on a bed of air, the strength of the blast being sufficient to keep it from falling through the tuyers into the blast way. During the blowing off of the carbon at this stage, a striking and magnificent effect is produced by the roar of the blast, and the volcano-like shower of sparks and the red-hot fragments from the mouth of the converter, as well as by the dazzling splendor of the flame. In about 15 or 20 minutes the whole of the carbon is dissipated. This "blow" being done, the converter is lowered to a horizontal position, and presently a red stream of molten speigeleisen is run into its mouth, till it amounts to 10 per cent. of the whole charge. The speigeleisen restores the proper amount of carbon to produce steel. There is a circular pit in front of every two converters, with a hydraulic piston in its center, and on its counterpoised arm a large ladle is hung, so that it can sweep the whole circumference. Round this the ingot moulds are arranged, and the hydraulic machinery is so conveniently planned,

that simply by moving levers, a man standing on a small platform can empty the contents of the huge converters into the ladle, raise or lower the ladle itself, and turn it round from point to point, so as to fill the moulds by means of a plug in its bottom. Steel made in this way is not sufficiently dense, and accordingly the moulds are lifted off the ingots by means of a hydraulic crane, and the latter removed while hot, and condensed under heavy steam hammers. After this they are rolled into rails, tires, plates, and other heavy objects, for which this steel is suitable. The above description we have transcribed from an English author because suitable to our purpose. I have just examined the statistics of the production of iron in the "Annual Record of Science and Industry" for 1877, the last published as yet. It gives the total number of tons of pig iron manufactured in the United States for 1876, as 2,093,236 tons of 2,000 pounds. Of this amount Pennsylvania produced 1,009,613 tons.

In 1876 there were 11 Bessemer Steel establishments in operation in the United States. They were located as follows: 5 in Pennsylvania, 3 in Illinois, and one each in New York, Ohio and Missouri. The number of converters was 22. Pig iron and spiegel converted in 1876, 539,474 tons. Ingots produced, 525,986 tons. Rails produced 412,461 tons. Thus about one-fourth of the entire product of pig iron for the year was consumed by the Bessemer steel industry, and the use of this steel is increasing and will demand yet larger quantities.

It is very important for those who shall pursue the trains of reflection suggested by reading the foregoing, to remember the statements herein contained. These facts are not detached fragments, mere fugitive statements, but are written with the intention to preserve and instruct. To those therefore who are unacquainted with the nature and manufacture of iron, the definitions and descriptions of this article will be of much service. And they will tend to refresh minds which are partially familiar with the subject.

In the New York *Daily Graphic*, of May 3, 1878, occurs a description of the advantages of Harrisburg, which, by a substitution of name, is equally applicable to Baldwin. We have made a selection of it for our readers. A careful perusal of it will exhibit what a strategic situation is occupied by the Pennsylvania Steel Works in relation to the country of the future.

The town of Baldwin is delightfully located on the most picturesque of rivers. Of its location in the centre of the great iron trade of the country, of its manufacturing advantages and the thrift of its citizens, the limits of a brief article prevent as full details as would be desirable, especially to show manufacturers and capitalists from a distance the immense facilities which Baldwin presents, and which bid fair to make it a great inland town of the future. Topographically, it is located in the centre of an area unsurpassed by that of any inland town in the Union for its great advantages as a manufacturing locality and its immense facilities as a shipping point. The Kittatinny belt of limestone commences at the Hudson, just above West Point, Newburg being situated upon its escarpment on the North River. This wonderful development takes a southwestern direction, and is continuous from the Hudson almost, if not quite, to the Mississippi, from ten to thirty miles wide and of a depth not yet ascertained. It is one of the early species of the rock called by geologists *matinal*, *anrora*, &c.—words indicating the morning. It possesses all the valuable qualities of limestone, especially that of conferring richness upon the adjacent soils, strength and durability as a building material, the chemical quality of a flux in the iron furnace, &c. The locality of this belt on the map pre-supposes the delightful climate that reigns over it, and on the whole it may be pronounced the most desirable stretch of ground for its great size and absolute continuity that exists in the world. Even east of the Hudson it confers its benefits; but from the Hudson to East Tennessee it is homogeneous and as an agricultural region unsurpassed. The

Lehigh region of Pennsylvania, the Lebanon Valley, the Cumberland Valley and the valley of Virginia are all parts of this grand Kittatinny Valley.

It is bounded on the south by the range of hills which cut through by the Hudson at West Point, is gapped on the Delaware below Easton, on the Schuylkill below Reading, on the Susquehanna above Columbia, on the Potomac at Harper's Ferry, on the James at Balcony Falls, on the Roanoke at the Hawk's Nest, on the Yadkin (Upper Pedee) at the Narrows, &c. This range of hills contains far the largest proportion of iron that is to be found in the United States, for iron is to be got upon almost every mile of their length, from Connecticut to Tennessee.

It is bounded on the north by the first spurs of the Alleghany range, and coal is as plentiful in this region as iron is in the other—a wall of iron on the south—a wall of coal on the north—and a submerged pavement of limestone, perhaps a mile in thickness, beneath this last, covered with a soil anticipating the husbandman's labors, the whole breathed over by a climate which for the health and happiness of mankind cannot be surpassed. Is there such a tract of land anywhere else in the world? If there be, the fact is not yet developed.

But this hill of limestone covered with soil has no mountains crossing it, only such elevations as form the collateral water sheds of the streams that pass through it transversely. And if its direction be glanced at, it will be found to terminate in the seaboard near New York, and in the interior near the Mississippi—occupying a central line of the whole territory south of the lakes and east of the Mississippi—evenly dividing that magnificent area in a diagonal direction. This pre-supposes—that the best line of railway for the use of the inhabitants in contemplation should occupy Kittatinny Valley.

The railroad alluded to wants but a very few short gaps of completion now, and when it is finished it is easy to see that it will prove to be probably the most important road in the world.

Now, looking at the location of the town of Baldwin, in reference to what has been just said, it is found to be in the midst of the Kittatinny Valley, not quite one hundred and eighty miles from the Hudson, with which it is connected by railway. It is on the Pennsylvania Railroad, 250 miles from the Ohio. A railway passes through it from Baltimore, running north to Lake Erie, striking the shores of that lake at two points, Buffalo and Erie. The Harrisburg and Potomac and the Cumberland Valley Railways already extend far into the valley of Virginia, and will soon be continued down into Tennessee.

Within thirty miles of Baldwin there is a pile of iron that has but to be shovelled away, containing over 40,000,000 tons. Coal is within a few miles. Within a radius of ten miles there are extensive quarries of brown stone and granite for building and other purposes—the latter equalling the far-famed Quincy granite—with sand and quartz rock for making flint and plate glass, as yet an undeveloped business, but one which will necessarily invite capital and that speedily. Limestone for all purposes, as heretofore remarked, is in abundance; and surrounded by a rich agricultural region, with scenery unsurpassed, there is everything to induce the flow of capital in the direction of Baldwin.

The author of "Fourteen Weeks in Chemistry," (J. Dorman Steele,) says, p. 125, that "iron is worth more to the world than all other metals combined. We could dispense with gold or silver,—they largely minister to luxury and refinement,—while iron represents only the honest industry of labor. Its use is universal, and it is fitted alike for massive iron cables, and for screws so tiny that they can be seen only by the microscope, appearing to the naked eye like grains of black sand."

"Iron vessels cross the ocean,
Iron engines give them motion,
Iron needles northward veering,
Iron tillers vessels steering,
Iron pipe our gas delivers,
Iron bridges span our rivers,
Iron pens are used for writing,
Iron ink our thoughts inditing,
Iron stoves for cooking victuals,

Iron ovens, pots and kettles,
Iron horses draw our loads,
Iron rails compose our roads,
Iron anchors hold in sands,
Iron bolts and rods and bands,
Iron houses, iron walls,
Iron cannon, iron balls,
Iron axes, knives, and chains,
Iron augers, saws, and planes,
Iron globules in our blood,
Iron particles in food,
Iron lightning-rods on spires,
Iron telegraphic wires,
Iron hammers, nails, and screws,
Iron everything we use."

The value of iron depends upon that into which it is manufactured. "One pound of good iron is worth four cents; made into bar steel, it is worth seven cents; one-inch screws, \$1; steel wire, \$3 to \$7; sewing needles, \$14; fish hooks, \$20 to \$50; jewel screws for watches, \$3,500; hair springs for American watches, \$16,000."—(Compendium of Popular Information, p. 484.)

In mythology, Vulcan is represented as the god of fire. He had a magnificent palace in Olympus. It was "immortal, brazen, shining like stars," and contained his workshop. There was an anvil and twenty bellows which worked at his command. There were later fables which gave him a home in some volcanic isle. The tales of his glory have been woven into the texture of poetry, both ancient and modern. As one is permitted to gaze on a cloudless night upon the mammoth proportions of the works of the Pennsylvania Steel Company, all the descriptions of the realm of Pluto are brought to first recollection. It does appear as though Vulcan had removed his works to the surface of the earth, and all the shadowy mysteries of Homer were transpiring before our eyes. Work is being accomplished as gigantic as that of the renowned Cyclops. Columns of fire pierce the sky, and rolling clouds of smoke, some ashen-hued, some flame-tipped, some black as the raven's wing, through the black, rushing smoke-bursts which breaks the red flame; and the buildings gleaming in the glare of the furnace fires, standing out in their solitude with ghostly grandeur; the rushing locomotives with their shifting

cars, the bells ringing as cautionary signals, the alarm whistles, the echoes falling in resounding reverberations from the hammers of the bloom mill, the puffing of the steam from the snorting engines, contribute to form a scene which cannot easily be described by the pen, but one which once passing under the eye of the beholder is not quickly forgotten. Witnessed by the employees so often it becomes a common occurrence, but those from a distance who behold it for the first time confess themselves to be overwhelmed with its indescribable magnificence. Standing upon an eminence and looking upon these mighty achievements, these potent mechanical appliances, one cannot help but realize some of the strength of human might, that the chaos of alchemy has been reduced to a science, and results have been harvested more golden than those of the philosopher's stone; that under the cover of the smoke, amid the scintillations of the steel, brothers of toil are wrestling with the omnipresent factors of American civilization. It gives to the mind a conception of power like that which comes when standing by the awful rush of Niagara. The contemplation, therefore, presents a scene of sublimity which gives it rank among the stupendous forces of this world.

And there are beauties in the scene, too. The grand pyrotechnics exhibited at the close of our national holiday, when patriotism bubbles over, often with effervescence of extravagance, does not equal in brilliancy the crystal splendor flashing in corruscations a gorgeous cataract, a falling fiery shower from the blazing bosom of the expiring carbon, with countless reflections and myriad charms. Through the hours of every day there are fire-works for the million. It has occurred to us sometimes why Yankee inventiveness has not taken possession of this and made it serve the purposes of Mammon. But, thanks to Nature, these beauties of crystallization are born to feast the eye of the untutored, and to lure them on to the deeper mysteries which are concealed in the vast and glorious realm of chemistry and metallurgy.

After prospecting in different directions for an available site for a considerable time, the Pennsylvania Steel Company finally made choice of the land now occupied by them. The land was evidently a reclaimed swamp. Once over it had rolled the broad, deep waters of the Susquehanna. The tract was level, and would afford them many conveniences. Being low, there would be ample space for a long time to deposit all the refuse. It was contiguous to the great Pennsylvania Central Railroad, and also to the Pennsylvania Canal. It is close to Harrisburg, a great railroad center. It was not far from the coal mines. It would afford them a glorious opportunity to rescue from barrenness almost, and to make the valleys and the hills smile with abundance of life and prosperity.

The citizens of Harrisburg and vicinity became interested in the contemplated works. Subscriptions were raised, and the land was presented to the Company. This donation embraced about forty acres purchased of Mr. Henry Kelker, and about sixty acres more of Mr. Rudolph Kelker. This was in 1865. Improvements were commenced immediately. The first building erected was the Bessemer furnace. And the Company since have been constantly making improvements. They have now a Bessemer with two converters, three spiegeleisen cupolas (only one in use however, it furnishing all that is needed), a rail mill and a forge. They have gas furnaces, and air furnaces, a blooming mill, a machine shop, a frog shop, a boiler shop, a blacksmith shop, a tinshop, a store house, a foundry, a pattern shop, and two blast furnaces. There are other improvements in course of construction. There is to be an additional Bessemer furnace near the old one. The forge mill is to be extended.

The average run of the present Bessemer furnace is about 350 tons in 24 hours. They manufacture a great deal in steel ingots in what is called "specials." These have a carbon test of 64-100 to 74-100 per cent. These specials are run into moulds and then rolled into blooms, and then forged into "billets." They are used

as spring steel, and for other purposes. This is now made of a quality equal to open hearth steel.

One of the utilities of the Bessemer is seen in its present method of drying the ladles. Formerly to do this 115 bushels of charcoal were consumed each 24 hours. They now receive gas direct from the gas producers to accomplish this result. The Bessemer is furnished with five hydraulic cranes and a hydraulic ram.

At the Bessemer the mixture in each charge is composed of the following irons. It should be understood by the reader that at the Bessemer furnace only pig iron is used—no ores in their native state. To reduce these ores to pig iron is the province of the blast furnace. The Company's two blast furnaces have capacity to only furnish about one third of the iron needed by the Bessemer. The irons used at present, which will include all in the yard, are from the Pennsylvania Steel Company, Graffton, Cornwall, Wister's, Lebanon, Struthers, Paxton and Winer's. The spiegeleisen is added, it will be remembered, at a later stage.

There is an open hearth furnace, erected in 1875. The site of this being needed it is to be taken down, removed and rebuilt. "The open hearth furnace consists of two six-ton Sieman-Martin or open hearth steel making furnaces. They are of the latest and most improved form, and the first of their kind erected at Bessemer steel works in this country. They utilize the scraps of the forge and rail mills. The scraps are dissolved in a bath of melted pig iron, and the carbon is burnt off by the oxygen of an iron ore, instead of by the free oxygen of the air, as in the Bessemer process. Re-carbonization is effected by the use of spiegeleisen and ferro-manganese. From gas made in Sieman's producers these furnaces obtain the highest degree of heat used in metallurgy. The product is about twenty-two tons of steel in every twenty-four hours." They can now make forty-five tons of steel in twenty-four hours. The Works are penetrated and surrounded by a network of railroads, so as to assist in the distribution of mate-

rial. There are six locomotives constantly at work in the yard, and so vast is the work that these sometimes are insufficient to accomplish all to be done.

Foreseeing their interests, and opportunity, the Philadelphia and Reading railroad have made an extension of their track from the terminus of the Lebanon Valley railroad to the Steel Works. Already there are heavy shipments made over this branch to this place. The railroad company will rapidly reap ample remuneration for the capital invested, and time will continue to demonstrate the wisdom of their work. It is intimated that this is only the beginning of yet larger railroad ventures.

The first bridge over the canal breaking down with a mule team upon it, the Steel Company promptly rebuilt it with a frame structure. Through the Company's generosity in 1877, a substantial iron bridge was made to span the canal at this point. This bridge is broad and strong and will survive the continual wear and tear for a long time.

The Pennsylvania Steel Company have also largely provided for the shelter and homes of their employees. The spacious building now occupied by the Company's offices was erected to be used as a boarding house for the men. They purchased ground upon the hill back of the pike, from Mr. Travitz, where they built other buildings, which were used as a boarding house for the clerks and officers of the Company. They were used for this purpose for some years. Additional buildings have been erected, a verdant lawn has also been constructed, until now the beautiful and commanding site is occupied as the individual residence of the General Superintendent of the Works. As many of the employees desired to have their families here, the Company has built several rows of brick buildings for their accommodation. These dwellings are large, roomy, and the rents are comparatively low, considering what is given. The Company has also been mindful of the health of the families of their men. They have filled many a marshy pool, and have constructed in solid

masonry a large aqueduct of considerable length to carry off all stagnant water. It is conceded that the Company has contributed much to the increased healthfulness of the place. They have watchmen at night to guard the buildings from fire, and they have hose and fire plugs at ready command to extinguish any conflagration before it could obtain much headway. There are abundant precautions used to preserve the lives and health of all employees, and to guard against unforeseen accidents.

The skilled artisan, passing through the Works, will not fail to observe that in every department there is visible the latest fruits of invention. To the unskilled eye this is often so apparent as to excite their surprise. There are parts performed by the machinery, perfectly automatic, and yet so intricate in the complication of their duties, and yet withal so deftly fulfilled, as to almost challenge belief. I have stood by the machinery often astonished and awed by these expressions of human ingenuity. These exhibit the royalty of man. Man can harness the forces of Nature—forces which have slumbered for centuries, and invoking their aid, under the sway of a dominant purpose, he can give even to the lifeless metals attributes of power, or bid them quickly obey his behests and lightly bear the burdens which otherwise would rest heavily upon his own shoulders.

It may be interesting to our readers to furnish a list of the principal ores which are in use at this time by the Pennsylvania Steel Works, in the manufacture of Bessemer steel. This will afford some idea of the scope of territory covered by the Company's operations. The names of some may be omitted. Green Pond, a magnetic ore, comes from Essex Co., N. J.; Bloomfield, a brown hæmatite, from Huntingdon Co., Pa.; Pig River, a mixture, of magnetic and hæmatite, from Virginia. (This mine is owned and operated by the Penna. Steel Co.) Champion, from the Lake Superior region, is a specular red hæmatite. Dillsburg, a brown hæmatite, is from Pennsylvania. Two African ores

—Mokta and Tafna—are both hæmatites. Two Spanish ores—Somorrostro and Por-man—are also hæmatites. The Cargon ore is a brown hæmatite, from Ireland. It would be impossible to give the number of tons used, or the cost per ton, without considerable trouble, and access to the Company's books. And even if we could give these items, their publication by us might be a breach of trust; and would do no good, except to satisfy the curiosity of those who desire to know all the particulars of the private business of an immense corporation. In the absence of this, it may be as profitable to give what the Company have published as the results of their steel production. It will be sufficient to give two years, that we may draw a comparison between them, and mark the advance of steel production in eleven years.

In the year 1867 the entire production of steel was a total of 1,005 tons. In the year 1878, 67,071 tons of steel were produced. To achieve this result, the amount of coal consumed is enormous. We have before us a printed estimate which we presume we may make as a general average for the present rate of consumption. This writer in 1872, with the production of steel rails at 45,000 tons, gives the amount of coal: bituminous, 100 tons; anthracite, 90 tons, and of coke 30 tons in 24 hours

The Pennsylvania Steel Works are the oldest works of the kind now in existence in the United States. There was a small mill at Troy, New York, which was burned. It was very small. The converter was turned down by hand. Its capacity was also very limited. The Company was organized in 1865, under the title of the "Pennsylvania Steel Works," for the production of steel by the Bessemer pneumatic process, and the manufacture of the same into rails and other products. The production of steel commenced in June, 1867, and steel ingots were sent to Cambria to be rolled. The rail mill was completed and in operation in 1868, making the rail direct from the ingots. In 1869, the forge department was added and the ingots were then hammered into blooms

before going to the rail mill. In 1876, the blooming mill went into operation, taking the place of the hammers.

The original capital of the Company was one million dollars. This was subsequently increased to two millions, with an addition of three hundred thousand dollars in bonds of the Company, as a first mortgage upon the property of the Company. The original shares were at a par value of \$1,000, Mr. J. Edgar Thompson's name being down for eighty shares. The shares were afterwards placed at a par value of \$100. The general office and headquarters of the Company are at 216 South Fourth street, Philadelphia.

About sixty of the principal railroads of the country are using, to a greater or less extent, the steel rails manufactured at Baldwin. A still larger number are using the switches and frogs manufactured here. The character of the latter is said to be unsurpassed by any company in the United States. This has created a large demand upon the resources of these departments which to meet with promptness keeps them fully occupied.

We furnish a few quotations from the Company's published announcements:

"The first steel rail rolled in this country in the way of regular business was rolled from steel made by this Company in 1867, since which time the growth of its business has been steady and uniform. The advantageous situation of the Works enables a judicious selection of the best materials in the country for the manufacture of steel to be made, while it is at the same time convenient for the distribution of the products."

"This Company have for several years past employed a force of skilled labor in the manufacture, from its standard steel, of rails, railroad crossings, frogs, safety switches, &c., and, having kept steadily in view the production of only first-class work, they have from time to time adopted such various improvements as now enable them to offer a variety to suit the wants of any railroad in the country. Also such modifications made of the details of the various designs as were suggested and ap-

proved by an extensive experience; and it is but fair to state that no similar establishment in the country has better facilities for the prompt despatch of large orders, or for thorough and systematic execution of the work."

This Company manufacture the Lorenz Safety Switch, of which we give the description: "The switch or point rails are made to fit the track rails completely, taking a full bearing on the flange or bar, and fitting closely to the underside of the head. The thin point of the switch is made lower than the outside rail, so that the flange of the wheel does not touch the switch rail for some distance from the point. The switch rails are securely held against the outside rail by the action of a powerful India rubber spring, which will, however, yield for trains from the turnout to pass on to the main track. The outside rails are not notched or cut, nor in any way changed from their shape as rolled. The parallel bars connecting the point rails are accurately made of good wrought-iron, dropped as low as possible, and thoroughly secured by bolts, each provided with a good nut lock. The switch plates, on which the points slide, are of wrought-iron, each provided with brace for the outside rail."

We name some of the railroads which have the switch in use: Atlantic & Gulf; Atlantic, Mississippi & Ohio; Allegheny Valley; Baltimore & Potomac; Baltimore & Ohio; Boston & Albany; Central R. R. of New Jersey; Catasauqua & Fogelsville; Charlotte, Columbia & Augusta; Cumberland Valley; Harrisburg & Potomac; Lehigh Valley; Mobile & Ohio; Nashville, Chattanooga & St. Louis; Naugatuck; Northern Central; North Pennsylvania; Pennsylvania; Philadelphia & Erie; Philadelphia & Baltimore Central; Philadelphia & Reading; Providence, Warren & Bristol; Pittsburg, Cincinnati & St. Louis; Pittsburg & Connellsville; Richmond & Danville; Stonington & Providence; United Railroads of New Jersey; Union Pacific; Vermont Central; Western Maryland; West Wisconsin; Wilmington & Weldon; Wilmington, Columbia & Augus-

ta. These are a partial list ; and there are others which are as worthy of mention, but these are enough to convey to the mind of my readers some idea of the magnitude of the trade of the Pennsylvania Steel Co. in the manufacture and sale of the Lorenz safety switch, in which "safety, durability and economy are combined."

The Company also manufacture steel rail crossings. Their standard crossing is designed to be equal to the needs of roads of the heaviest traffic, high speeds and most constant use. "It has solid corners forged out of solid rails, making as few joints as possible, (or, sometimes mitered corners as the angle renders most desirable.) These are mounted on strong wrought-iron bed-plates, planed out to receive the rails, which are securely riveted to the bed-plate by counter-sunk rivets, through the flanges. At all the angles, wrought-iron throat filling planed to fit closely to the rails on the flange and under side of the head, fills the space between the rails, and is riveted with heavy rivets to the bed-plate. Strong bolts, closely-fitting holes drilled through the web of the rails and the throat filling, also serve to bind the whole superstructure solidly together."

Their crossings are also furnished in several other designs. These are adapted to various roads. "Over a hundred of their best crossings have been manufactured, many of them very extensive and complicated, for railroads in all parts of the country." Several have been constructed since the above was published.

This Company also manufacture the spring rail or main line frog, (Billings' patent.) This is made of the best quality of steel rails, upon a strong bed-plate of wrought-iron, to which the rails are securely fastened. "This frog has been approved and adopted as the standard frog for main lines by a large number of the most prominent railroads in the country."

The list of patronizing railroads is very large, but we will not weary our reader with the repetition of their names.

The Company manufactures the "Steel Rail Stiff Frog"—Atkinson's patent.—"This frog is simple, strong and durable,

fitting directly into the track with as perfect and elastic joints as the rails, and as permanently secured in place, with requisite length for stability." It has been thoroughly tested by many prominent railroads and found to be durable and economical. We have under our eye, as we write, the names of 65 patronizing railroads.

The Company manufactures the steel rail and plate stiff frog. In view of its simplicity, strength and durability, many railroad men have preferred it above any other style. The Pennsylvania Steel Works are prepared to furnish various other styles of frogs, including Close's improved frog, (with welded point.) The Patterson patent elastic frog, (with cast steel point,) and any other special frogs according to design submitted.

This Company also manufactures a Patent Car Replacer to replace cars and locomotives which have left the track. Their value and efficiency have been highly commended. "The device consists of a pair of double-inclined planes, with hooks for securing them to the track, and provided with rails to guide the wheels inward to the track. The base of the inclined planes lies on the cross-ties, and the surface rises from the base at each end toward the centre, so that cars can come on from either direction, the upper surface of the inclines being $\frac{1}{2}$ inch plate. Each one is provided with rails of suitable design to receive the wheels. The one which is to take the wheel that is inside of the track has a rail for the flange of the wheel to run on, and raises the wheel high enough to carry the tread of the wheel on to the rail; the plane that is to take the wheel that is outside of the track has a rail for the tread of the wheel to run on, carrying the wheel high enough to take the flange over the rail. The application of the car replacer is simple, and they are designed to be carried on every train, so as to be at hand in case of accident."

The Company also furnish common stub switch. These "include head blocks, and everything but rails, and have low-down tumbling or monkey stands, or upright

stands, with targets, as may be required."

We wish we were at liberty to present our readers with the beautiful illustrations which accompany the quotations we have made from the published advertisement of the Pennsylvania Steel Company.

The Company's high reputation is maintained by thoroughness in each department. Specimens of the ores and irons as they reach the Works are thoroughly analyzed by the Company's chemist. And when the iron reaches the Bessemer furnace great care is taken to have an appropriate record made. To assist in this there is at hand a beautiful spectroscope, imported, I believe, from Germany. This spectrum analysis was one of the inventions of Sir Isaac Newton. Every "blow" in the Bessemer is numbered, a record of which is kept, together with a carbon test. The carbon test must be within 30-100 to 50-100 per cent. A bar is punched out of the web of the rail, and bent cold to an angle of less than ninety degrees. If the rail stands this test then it is considered a No. 1, if not it is called No. 2. Imperfect rails are also of No. 3.

"Every charge is numbered, a corresponding number put on every rail made from it, with the year in which it was made, and the brand of the Company. Thus each rail has its record, and if any one were taken out of the track twenty years after it had been laid down, and the number of it given to the Steel Company, they could tell precisely the material used in making it, the day it was cast and rolled, and the conditions under which it was manufactured."

In "*The Journal of the Iron and Steel Institute*," for 1878, published in London, a copy of which is before me, occurs an excellent article on "Bessemer Steel and Steel Rails," by Mr. C. B. Holland. At p. 115 is quoted a prophecy of Mr. Bessemer, made in 1856 or 1857. He said: "You will see that iron rails will disappear, and that steel rails will come to be sold at £6 per ton." The author adds: "The first part of that prophecy was nearly fulfilled, and the second part had absolutely come to pass." And then follow many sugges-

tions and a full discussion of the relative merits of Bessemer steel rails over the old iron rails. We have quoted the *Journal*, so that any who choose may pursue this and kindred subjects further. We notice that Mr. Harry Bessemer's name appears in place as one of the past Presidents of the "Iron and Steel Institute."

We have reserved a brief space in which to describe the manufacture of steel rails from the beginning, and also some official statements as to their superiority, and therefore great cheapness as compared with the old-fashioned iron rails. We have been led to do this because this article will be distributed widely over the country, and will be used by many who are wholly ignorant of both the practice and the theory of the manufacture of steel or iron rails. Then we desire to inform the young, and to make our statements very simple and yet full for their benefit.

There are persons of considerable general information, who can repeat that poem of John G. Saxe—"Rhyme of the Rail"—and yet they have no very clear conception of iron in the various stages of its progress until it comes out finished, and ready for the passage of the lightning express. We desire to assist all such so they may sing more fully,

"Singing through the forests,
Rattling over ridges,
Shooting under arches,
Rumbling over bridges,
Whizzing through the mountains,
Buzzing o'er the vale—
Bless me! this is pleasant,
Riding on the rail."

We commence with a description of a blast furnace. Many costly experiments have been made to determine which method for their construction is the best to produce iron, and the most serviceable. It is thought by some that furnaces of the unusual height of 80 to 100 feet give the best results. Irrespective of minor differences, there are two types of furnaces. "Some are built with brick walls, either entirely of brick or of brick and stone, hooped with iron, forming massive towers. Others are formed of comparatively thin brick walls, and depend for their strength

upon an outer malleable iron casing, in which case they are called *cupola* furnaces." The shaft or body of the furnace is in the form of a cone or cylinder, or barrel-shaped. The lower part of this is called the "bosh." This is exposed to the greatest heat, and is the part which usually first gives way. At the lower extremity of the shaft is the hearth, and at the upper is the tunnel head. The latter is sometimes wanting, when the mouth is covered by a bell and cone to prevent the gases generating in the furnaces from escaping. At the top of the shaft there is a charging platform, by which the materials are emptied into the shaft. The material is brought here by hoists, inclines and level gangways, according to the situation of the furnaces.

"As a preliminary process to the actual smelting in the blast-furnace, clay and black band ironstones are generally roasted. This is accomplished by breaking the ore into small pieces, spreading it in open heaps on the ground, and mingling it more or less with small coal, according to the nature of the ore. Blackband commonly contains enough of carbonaceous matter to burn without the addition of coal. The pile which may contain from one to several thousand tons of ore, is lighted at the windward end, and burns gradually along, aided by occasional fires in the sides, till the whole heap has undergone calcination, the time required for this purpose being generally about a month. Sometimes the operation of roasting is performed in close kilns, instead of open hearths, a mode by which the ore is considered to be more uniformly roasted and with less fuel. Of late years the kilns are often heated by the waste gases of the blast-furnace. By calcination, clay ironstone loses from 25 to 30, and blackband from 40 to 50 per cent. of its weight, the loss consisting chiefly of carbonic acid, but sulphur and other volatile substances are also dissipated in the process. The roasting also converts the protoxide and carbonate of iron into peroxide, which prevents the formation of slags of silicate of iron, such slags, owing to the difficulty of reducing them, causing a loss

of iron."—(See article on Iron in Chambers' Encyclo.)

The operation of smelting is thus performed: The roasted ore, coal and lime are moved along a platform or gallery near the top of the furnace, and fed into it at intervals, through openings in the side, when the mouth is open, or by lowering the cone when it is closed. The materials are raised to a very high heat, and gradually fuse into a softened mass. The clay of the ironstone then unites with the lime to form a coarse glass or slag, the oxide of the iron at the same time gives up its oxygen to the fuel, and allows the metal itself to collect on the hearth at the bottom of the furnace, united with from 3 to 5 per cent. of carbon, which it takes from the fuel, forming the variety called cast iron. Every twelve, and sometimes every eight or six hours, the metal is run off from the furnace by means of a tap-hole at the bottom of the hearth, into rows of parallel moulds called pigs, which are formed in sand, hence the name "pig iron." The slag which floats on the melted iron is run off through an opening at the top of the hearth. If the furnace is working well, the slag should be of a light-gray color; a dark-brown or black color shows that too much iron is passing into it.

In early times, the iron ores were reduced in a simple conical furnace, called an air bloomery, erected on the top of a hill, in order to attain the greatest blast of wind. The furnaces were subsequently enlarged and supplied with an artificial blast. Charcoal was the only fuel used in smelting till 1618, when Lord Dudley introduced coal for this purpose. There was much opposition to it, and the improvement died with him. It was re-introduced by Abraham Derby, at his furnace at Coalbrook Dale, in 1713. About 1750 the introduction of coke gave renewed vigor to the iron trade, and then followed in rapid succession those great improvements in the manufacture which have given to the history of iron the interest of a romance. The introduction of Watts' steam engine, in 1770, and the employment of the hot

blast first, in 1830, have been of inestimable service.

This blast is produced now by a blowing engine. Some of the largest of them discharge 60,000 cubic feet of air per minute, under a pressure of $3\frac{1}{2}$ pounds per square inch. A large surface of the pipe is exposed, and this air is frequently heated to a temperature of 600° to $1,000^{\circ}$. At some temperature within this range, it enters the lower part of the furnace by means of the tuyeres.

The pig iron is then used in the Bessemer. This process has already been described. These ingots are taken to the blooming mill. They are heated to a white heat in the air or gas furnaces. They are then passed under a three-high train of thirty-four-inch rollers. They are passed from the furnaces to the rollers, and also from the hammers to the rail mill, by hydraulic engines. These rollers are called the "blooming train." The ingots are then passed under a trip-hammer, weighing seven tons. It has a maximum force of many tons. It can hammer steel from the largest size to two and a-half inches square. The anvil block weighs many tons. There are two other hammers and the foundations for a fourth are being prepared.

The blooms reach the rail mill from the forge, where the ingots have been divided into two or more, so that each bloom will make one rail. In the rail mill the blooms are re-heated. "It then passes through the roughing rolls and the finishing rolls. It passes six times through the one and five times through the other, diminishing in thickness and increasing in length at each passage until it comes out a rail of the desired pattern, weight and length. Its last run through the roll draws it out to the length of about 33 feet. It is then placed under two circular saws 30 feet $4\frac{1}{2}$ inches apart, and in the twinkling of an eye both ends are cut off, leaving it exactly 30 feet long after it contracts in cooling. The rail is then placed on a straightening plate to cool. As it does not become perfectly straight, however, it is taken in hand by two men and straightened by means of a press, called a cold straightener. Then

holes for fastening the fish-plate are drilled, and it is ready to fill its place in the road-bed."

In the ITEM of January 17, 1879, there was published the possible productions of the rail mill: "During a run of nine consecutive turns, from Wednesday, Jan. 8, until Thursday, Jan. 14, night and day turn of twelve hours each, aggregated the enormous number of 6,108 rails, weighing 1,359 tons, in 100 hours, including stoppages for oiling the machinery and other purposes." It is stated as an average possibility to run rails through at the rate of one a minute, including necessary stoppages. This is excessive work and could not long be maintained without injury or death.

The total amount of rails manufactured in the United States of all kinds, for the year 1878, was 882,685 tons. This would furnish sufficient rails to lay a track from New York to San Francisco, and another from New York to New Orleans, and yet leave rails enough for a road from New York to Bangor, Maine, and to make all the tracks double. It would give an average of 100 pounds per yard. 1,000,000 tons of rails were rolled in 1872, and it is thought the prospect for 1879 is equally good.

There are three kinds of rails manufactured by the Pennsylvania Steel Works. There are the T rails, the center-bearing or bridge rails, and street car rails. During the past winter they have shipped 25,000 tons to the Oregon & California railroad. There are 16,000 tons more awaiting shipment to the same road. It will take months to fill the orders now on hand.

We chronicle the following valuable historical note of the first Bessemer rail ever laid. It was rolled from an ingot at the Ebbw Vale Iron Works into a double-headed rail, which was sent to Derby railway station, on the Midland railroad, to be laid down there at a place where iron rails had sometimes to be renewed within three months. This was early in 1857. Sixteen years afterward—in June, 1873—the rail referred to was taken out. This was the first Bessemer steel rail ever laid down, and during its lifetime about 1,250,-

000 trains and a like number of detached engines and tenders passed over it. (See "History of Iron Making and Coal Mining in Pennsylvania," by Mr. James M. Swank.) This certainly is a good record, but it must not therefore be expected that all rails will endure sixty-four times the amount of wear endured by iron rails, but that they will largely outwear the common iron rail, there is no shadow of doubt. The first Bessemer steel rails ever rolled in this country were rolled at the North Chicago rolling mill on the 25th day of May, 1865. "Several of these rails were laid in the track of one of the railroads running out of Chicago, and were still in use in 1875. The first steel rails rolled in the United States, upon order, in the way of regular business, were rolled by the Cambria Company, at Johnstown, Pa., in August, 1867, from ingots made at the works of the Pennsylvania Steel Company." (The Metallurgical Review for April 1878, page 161.)

It is well established that rails, whether of iron or steel, will last longer if the trains over them only pass in one direction. This is in accordance with scientific investigation. "The effect of laying rails in the magnetic meridian, in fact, the entire effect of the magnetic conditions upon the endurance of steel subjected to blows, is very imperfectly known."

"The power of any substance to resist wear is dependent upon two principal qualities, viz.: Hardness and elastic force." "With light weight and smooth and oiled surfaces, hardness is the leading quality. When wearing under great pressure, or with rough surfaces elasticity becomes of equal importance, as it restores the atoms to their former places, provided they have not been forced beyond the elastic limit. The elasticity of tempered steel, therefore, adds greatly to its wearing qualities." (Report of the Chemist of Cambria Iron Co. to the General Manager, Jan. 10, 1878.)

"Rails are generally of wrought iron, but steel rails have been extensively adopted where there is a continuous heavy traffic, and are found to reduce greatly the cost of maintenance, although more ex-

pensive in first cost." (Chambers' Encyclopedia, vol. VIII, p. 89.)

At a meeting of the American Institute, held in Baltimore, Feb., 1879, it was stated by Dr. Chas. B. Dudley, Chemist of the Pennsylvania Railroad, that along their 1,650 miles of track, in the year 1878, only forty-three broken rails had been discovered.

At the same meeting there was presented by Prof. Thos. Eggleston, School of Mines, Col. Col., N. Y., a rail from the track of the New York Central Railroad, at Spuyten Duyvel, which had borne 80,000,000 tons traffic, and had been eleven years in service. It was remarked that it was good for 80,000,000 tons more traffic. (See Report of the Chemist of the P. R. R., read before the Am. Inst., at Lake George.—"The chemical composition and physical properties of steel rails.")

We believe it is the general practice of American Bessemer furnaces to warrant their rails in constant use for a term of five years. "There has been no interruptions to the increase in steel rail production from the beginning." The production of steel rails in 1878 was much the largest ever known. It was 28 per cent. more than in 1877. (Railroad Gazette, May 16, 1879.) The total number of tons of Bessemer steel rails produced in the United States from the beginning to the close of 1878 was 2,145,595 net. (Statistics of the Am. Iron Trade, p. 24.)

One or two items in reference to the price of steel rails may be of general interest. The first importation of Bessemer steel rails into this country was in 1863, when a few tons were imported from England and \$150 in gold were paid for them. In 1867, when this country first began to make steel rails to fill orders, the price of English steel rails fell in our markets to \$118 in gold. Under the influence of competition the price of these rails has steadily declined to about \$45.

We give the yearly average price of American Bessemer steel rails for a period of eleven years, per gross ton: 1868, \$158.-50; 1869, \$132.25; 1870, \$106.75; 1871, \$102.-50; 1872, \$112.50; 1873, \$120.50; 1874, 94.-

25; 1875, \$68.75; 1876, \$59.25; 1877, \$45.50; 1878, \$42.25.

*[“The first open-hearth furnace introduced into this country for the manufacture of steel by the Siemens-Martin process was built in 1868, by Cooper, Hewitt & Co., proprietors of the works of the New Jersey Steel and Iron Company, Trenton, N. J. The building of this furnace was commenced by this Company in the spring of 1868 and in December of the same year it was put in operation.” (Metal. Review, April 1878, p. 164.)

Dr. C. W. Siemens and Frederick Siemens are brothers, natives of Hanover in Germany. In 1856 their attention was turned “to the construction of a gas furnace for the manufacture of iron, steel, glass and other products which require a high and uniform heat.” “In 1864 Messrs. Emile and Pierre Martin, of the Sireuil Works in France, with the assistances of Dr. Siemens, erected one of these furnaces to melt steel. In this furnace they produced cast steel of good quality and various tempers, and at the Paris Exposition, in 1867, their product secured for them a gold medal.” This process is the one chiefly used in this country. “The credit of introducing it is due to Hon. Abram S. Hewitt, of New York, who was favorably impressed with it when visiting the Paris Exposition in 1867 as Commissioner of the United States.”

The first Siemens gas furnace which was regularly introduced into this country for any purpose, was built by John A. Griswold & Co., at Troy, N. Y., and used as a heating furnace in their rolling mill, the license having been granted on the 18th of Sept., 1867. This was succeeded by others in various parts of the country. On the first of May, 1867, there had been built in this country 187 Siemens gas furnaces for use in the manufacture of steel, and of iron and steel products. There were 88 in Pennsylvania. There were 21 used in the production of open-hearth

steel, of which 5 were in Pennsylvania. In the year 1869 there were produced in the United States, 21,490 net tons of open-hearth steel, of which Pennsylvania made 7,547 tons. In the year 1878 there were produced 9,397 tons of open-hearth steel rails. The total production of open-hearth steel for 1878 was 36,125. This is a large increase over 1869.]

It will furnish some idea of the magnitude of the power employed by the Pennsylvania Steel Works to give a brief enumeration of their steam and other engines, and it may not prove uninteresting to the general reader.

We commence, as is appropriate, with the blast furnace. The No. 1 blast furnace has one engine of about 400 horse power. It was built by Henry G. Morris, of Philadelphia. The No. 2 blast furnace has two engines of from 400 to 500 horse power. They were built by George W. Snyder, Pottsville, Pa. It has one reversing engine for the elevator. In the rail mill there is one engine for driving the roll train of about 300 horse power. This was built by Pusey, Jones & Co., of Wilmington, Delaware. It has been in constant use since the erection of the Works. One fan engine (small), one saw engine, one drill press engine. Two straighteners and one test punch all combine an engine, each in their construction. There are eight 54-inch boilers.

In the bloom mill there is one main engine for driving the blooming roll train, of about 500 horse power, and one small fan engine, both built by Pusey, Jones & Co. One reversing engine for operating roll tables, being part of the blooming mill. One hydraulic engine for taking ingots from the furnaces to the rolls. There are eight boilers 54 inches in diameter and two boilers 60 inches in diameter. There is also a cold water engine for taking blooms from the cut-off hammer to the rail mill.

At the No. 1 Bessemer furnace there are two engines acting together on two blowing tubes, steam cylinders, and 350 horse power each. These furnish the blast for the vessels. They were built by Merrick & Sons, Philadelphia. There are two oscillating

*The matter in brackets should have been inserted earlier, on page 8, but we have the materials just at hand.

engines of fifty horse-power each, which furnish the blast for the cupolas. There are nine 54-inch boilers, which furnish the steam for all the engines in this department, and to seven double-cylinder Worthington steam pumps. There is one portable engine for grinding gannister. In the frog shop there is one engine of about 50-horse-power with one 72-inch boiler. In the machine shop there is one engine of about 50-horse-power, built by the Automatic Engine Co., of Ohio. It has one 72-inch boiler. In the pattern shop there is one engine of 25-horse-power and one boiler. This engine was built by Whitehill & Hampson, Newburg, New York. There is just finished a blowing engine for the foundry. It has one steam cylinder and three blowing tubes. It has 10-horse-power. There is under construction two double engines for the foundry crane, of 10-horse-power each.

The above does not include the six locomotives which are used as shifters, which would aggregate a capacity equivalent to many horse-power additional.

In determining the capacity of an engine it is commonly said it rates at a certain number of horse-power, the one horse-power being the unit of calculation. This is, of course, merely nominal. It is estimated that one horse in continuous exertion can raise a weight of 33,000 pounds a foot in one minute of time, or 550 pounds the same distance in one second. "Nominal horse-power is a term still used in England to express certain proportions of cylinder, but of no value as a standard of measurement. The actual or indicated horse-power of an engine is from three to five times the nominal horse-power. The elements of its calculation are the speed of the piston, and the pressure upon it as shown by the indicator card, or as calculated by approximate rules." (See Webster's Unabridged Dictionary, p. 639, and also Zell's Encyclopedia, art. horse-power.) One horse-power as used, therefore, as a unit of measure for a steam engine is calculated to do the work of eleven men; a ten-horse engine the work of a hundred and ten men. Should we make the very

low estimate of three thousand horse-power to be the aggregate of the combined engines of the Pennsylvania Steel Works, and a single one horse-power to be equal to eleven men, then these three thousand-horse-power would represent a force of thirty-three thousand men, or if the power were turned on to the utmost, one hundred and fifty thousand men. Here we find one of the sublime triumphs of modern machinery. In other words, to express it by weight, it would raise 33,000,000 pounds of pig iron one foot in a minute, or 36,000 steel rails 30 feet long and 90 pounds to the yard, to the height of Bunker Hill monument in 220 minutes, or the same weight to the height of the greatest Pyramid in eight hours. These estimates remind us of the song of Moses, where, while one was to chase a thousand, two were to put to flight ten thousand. (Deut. 32 : 30.) Here the proportion between individual heroism and that produced by combinations is as one to ten. A single individual working by himself does not make very apparent headway. He may bring to his help machinery and his power is vastly multiplied. He must have the strength of a giant to raise 3,000 pounds a foot in a minute. He puts four pounds of coal under thirty-four pounds of water and the steam generated will raise 33,000 pounds weight in an hour, and at the same rate for days and weeks. It never wearies. It needs no repose. It does not murmur. It has more patience than the camel. It is obedient to his will. Its tasks are performed by day and by night.

Statisticians calculate that there are now at work in the world some 200,000 steam engines, with a total power of 12,000,000 horses, corresponding to the muscular strength of 100,000,000 men. (Annual Record of Science and Industry for 1876, p. 435.)

"I blow the bellows, I forge the steel,
In all the shops of trade;
I hammer the ore and turn the wheel,
Where my arms of strength are made.
I manage the furnace, the mill, the mint—
I carry, I spin, I weave;
And all my doings I put into print
On every Saturday eve.

"I've no muscles to weary, no breast to decay,
 No bones to be 'laid on the shelf,'
 And soon I intend you may 'go and play,'
 While I manage this world myself.
 But hammer me down with your iron bands,
 Be sure of your curb and reins;
 For I scorn the strength of your puny hands,
 As the tempest scorns the chain."

PERSONNEL.

We have now traced the history of the Pennsylvania Steel Works down to the present time. It has been of necessity only a brief general survey. A great deal of the work which has been accomplished has been unnoticed. And yet for all this the foundations, though the most unobserved, are the most important. In the stability of the foundation rests the security of society, and of buildings, and of institutions. There have been noble, heroic, faithful men who have in our record no mention. Some have passed into other spheres of duty, some are residents of distant places, and some are in their graves. In the execution of our purpose, it is befitting that we give record of the present employees, and also of the officers,—their *personnel*.

The first man put in charge of the Pennsylvania Steel Works was Mr. A. L. Holley. From what we hear of him he was a good man, zealous for the interests of the company, and ambitious to stimulate the employees to the deep, full, earnest pursuit of knowledge. He was ready to assist by his generosity. He was, evidently, a man of literary tastes and has long been known as a writer for the periodical press. He gave his time and attention to the establishment of a library for the benefit of the men in his employ. This was certainly magnanimous. We have been permitted to read many of the volumes, which by the courtesy of the Trustees of the A. L. Holley Library Association, have been transferred into the custody of the Young Men's Christian Association, and from personal knowledge can speak of the high value of many of these works. We believe it is the intention of Mr. Holley to still further enrich this library by additional personal contributions. Certainly Mr. Holley can have no

more noble and imperishable monument erected to his memory in this scene of his labors than in the library which is honored by his name, and destined to be perpetuated by his munificence. Mr. Holley is the inventor of the intermediate receiving ladle, in use by all American Bessemer furnaces, and is the author of other inventions equally useful. Mr. Holley is also a writer of considerable ability. Mr. Holley at the Steel Works was succeeded by J. B. Pearse, who took the title of General Manager, Mr. H. S. Nourse holding under him the position of General Superintendent. These held their respective positions until October, 1873. Mr. Pearse was, as far as we have learned, generally respected and beloved by his employees. He did much in contributing to the Steel Works' prosperity. He had large plans before him, and many difficulties to encounter, was generous to benevolent objects, and left the impress of his character upon the Works. He was generous to the men under him—perhaps too much so to make large dividends for the Company. Mr. Pearse has occupied some position in the State, and a book on Mineralogy, we understand, was recently published by him.

Mr. H. S. Nourse has been represented to us as a gentleman, kind and social, making many friends among his employees, genial in his disposition, uniform, and well qualified for his position. From those with whom we have conversed in reference to him, we hear only words of commendation. Mr. Pearson has scientific attainments of a high order.

In Oct., 1873, Mr. Samuel M. Felton assumed control, having under him Mr. George C. Bent. Mr. Bent had charge of the Bessemer, of the foundry, and of the pattern shop. Mr. C. H. Jackson was superintendent of the forge and of the rail mill departments. Mr. Thomas Critchlow had charge of the machine shop, and general oversight of the steam machinery. Major Luther S. Bent was elected in Oct., 1874, to the position of General Superintendent, a position which he yet occupies. Mr. Bent is in the prime of life. He is

rather tall and spare, his hair slightly touched with the frosts of time, his form a little stooped, quick in his movements, with a sharp piercing eye, and is a shrewd observer of men and things. The weather has bronzed his countenance, but the heart of a lion burns within him yet. He was born to command men. He has keen perceptions, confidence in his judgment, is rapid in his decisions, unswerving in his purpose and fearless to execute. He has good qualities for a soldier, and would make an admirable officer for a regiment in the field, whether as Major, or commanding officer; upon the staff or Major General. He is like Grant, of few words, reticent to strangers, and with a habitual reserve to all, though it is said by those who have approached him, that under the coldness of the exterior there throbs a warm, generous, sympathizing heart. It has been remarked that as he crosses the pike homeward he leaves the coldness, and reserve behind and that his guests find him humorous, and a genial companion, full of sunshine and wit, and wisdom. We suspect he is of Massachusetts blood, and training, and therefore a man of positive convictions, a patriot by instinct, hating shams, despising hypocrisy, concentrating every energy to the achievement of success. We doubt if a more extended biography of him has ever been written. His autobiography, if given, would be very much like that one furnished on request by Abraham Lincoln. We suppose the personal expenses of most of his employees exceed his own. We question if he ever pauses to think of his greatness, or to number his hours of labor. We believe he devotes more thought, and time to his work than any man in his employ. We have an idea that newspapers, and books, and general literature have few charms for him. He is devoted to one object. He has singleness of purpose. He has learned the value of action. He has good health and immense reserve power. His mind is comprehensive. He was at the Works looking through every department for months before he was elected to his present

office. Therefore he is prepared to grasp the details of all departments under him. He is a strict disciplinarian, enjoins punctuality, hoards the fragments of time and material, is everywhere among the men, and the slothful workman fears his eagle eye. There could be found few men who are his superior in efficiency.

The President of the corporation of the Pennsylvania Steel Works is Mr. Samuel M. Felton. It is a compliment to Mr. Felton that he has been successively elected from the first, and fills his office with continued respect from the stockholders. He was formerly President of the Philadelphia, Wilmington & Baltimore Railroad. The present Secretary of the Company is Mr. Eben F. Barker. The Treasurer is Mr. Henry C. Spackman. The following named gentlemen are Directors of the Company: Messrs. S. M. Felton, Thomas A. Scott, Charlemagne Tower, Edmund Smith, William Matthews, Francis Thompson, William M. Spackman.

The Company's laboratory is situated here in the rear of the office. The present chemist is Mr. George R. Lincoln. He is assisted in his work by Mr. Macdonald.

The blast furnaces are at present in charge of Mr. Levi Boughter. He was one of the first in charge, assisted by Mr. Walter Hinchman. Then Mr. C. O. Parsons had charge. Mr. Boughter came to the work a second time. It was formerly in charge of Mr. J. L. McMichael, then Robert Pollock. The latter were foremen.

The machinery, and repairs, and water works of the blast furnaces are now under the charge of Mr. George McAllister.

The Bessemer furnace is in charge of Mr. William Golding. He is the first Superintendent. He has two effective foremen, Mr. J. B. Martin and Mr. R. H. Morrison.

Mr. William Batty has charge of the rail mill from the first, except a short time while he was away, and Mr. Martin Davis had charge. Mr. Batty has now charge of the rail mill, gas and air furnaces, (formerly in charge of Mr. William Floyd,) blooming mill, forge and hammers.

Mr. George C. Bent has charge of the

yard. This is a very delicate and important trust. It requires sagacity and a good memory. Efforts have been made to facilitate this work. There are various weighing stations. They have been connected by a telephone. This arrangement will prevent much confusion, and save many steps and hasten transportation.

The machine shop is under the direction of Mr. Thomas Critchlow. The blacksmith shop is connected with his department and is in charge of Mr. Edward Lewis.

The machine shop is a large building, 176x76 feet, recently erected, and is heated by steam in a dozen pipes running about the room. A glance at this department will exhibit how thoroughly prepared it is to perform all the work demanded to be done here. In the past, some kinds of work have been done at other places for the Company, but it is the intention, as we understand, in the future, to have all the repairs and new machinery done in their own shop. This will, doubtless, be an economy of time and expense. There are at present four planers, fifteen lathes, two powerful cranes, which may be connected with steam power, four boring machines, two drill presses, three shapers, one bolt cutter and two large grindstones. These are all connected by one main shaft running through the building, with six or seven intermediaries connected with the main shaft. The machinists attend to all repairs made in all parts of the Works. They can work in brass, or iron, or steel.

Arrangements have been perfected for the introduction of the electric light, (Brush's patent,) into the machine shop. This will greatly increase the effectiveness of this department, by giving them a brilliant, steady light, such as is demanded by the delicacy of their work. It will be an experiment, which, if successful, will lead to the general introduction of the electric light into all the departments of the Works.

Mr. Critchlow, the master mechanic, has been employed in the Works for several years. He is a practical workman. There are several of the most useful mechanical inventions used in the Works the creation of his fertile mind.

The first surveying upon the ground was done by Capt. Hartt. Afterwards, Mr. H. S. Nourse, while he was here, performed the duties in this department. At the present time, Mr. S. H. Chauvenet is holding the position of civil engineer, for the Company. He attends to the location of buildings, plans of railroads, etc.

The plans and specifications for the Company are drawn up by its chief draughtsman, Mr. H. W. Leuders. He is assisted by Mr. Williamson. A special draughtsman has been detailed and employed in the machine shop for a year or more, Mr. Richard Boreheus.

The draughts are prepared on tracing linen at first, and are then taken to the pattern shops, where models are made. These shops consist of two buildings; one 100x40 feet, the other 100x30 feet in dimensions. One of these is used to store patterns. The examination of these would furnish a profitable as well as interesting study for hours and days. They represent immense labor, accurate calculation, and are carefully wrought out by workmen of large experience. Here the models once used are hoarded for future use, and constitute a museum of curiosities of workmanship, exhibit human skill, and diversities of machinery. They are valuable, too, and both buildings are fire-proof.

The building in which work is performed is in two stories. There are fifteen men employed. They are all skilled artisans. The furniture of the room consists of one buggy planer, one hand jointer, one band saw, one double circular or cross-cut saw, one lathe, 12 feet long, 24 inches in width, with an extra head capable of 12 feet in diameter; one Daniels' plane, capable of planing a piece of wood 24x24 and 18 feet in length, and can be extended a length of 50 feet. There are fifteen work benches. This machinery is operated by an independent engine of 50-horse-power, manufactured by Hampson, Whitehill & Co., New York. This shop is lighted by gas from a gasoline reservoir in the cellar. The pattern shops are new buildings and were formally occupied by the workmen on April 27, 1878. The efficient foreman of

these shops is Mr. H. Fothergill. He succeeded Mr. H. F. Koesel.

The old pattern shop is 52x25, and is now used for a tin shop, where four persons are employed, a boss, two workmen and a boy. This is in charge of Mr. John Fisher.

The boiler shop is in the same building with the frog and switch department. Mr. Jacob Good has charge of the boiler department. The number of men employed here is considerable. The machinery used is excellent.

The frog shop is in charge of Mr. J. T. Richardson.

There are about a dozen carpenters, of whom Mr. John Barnett is foreman.

The store house is in charge of Mr. A. Gardner. Here the hose is kept ready for use. There is a large tank for carbon oil. It will hold 3,300 gallons. It is pumped by an automatic air pump. In this building is found all the tools, ropes and general merchandise necessary to the various departments, which are issued only by order from the superintendent of each department, or under his direction. There is also a store house for iron, in charge of Mr. Frank Shaffner. It furnishes gas fittings, valves, gauges, etc. There is also a store house for fire brick, fire clay and fire sand.

Mr. Augustus Millhouse has charge of the foundry. The first foundry boss was Mr. Jos. A. Fletcher. He was succeeded by his brother, Mr. William Fletcher. Then came the present one. Here the castings for the various departments are made. This branch of work has so increased that the foundation for an addition to the building is already laid, and the walls are rising toward completion as we write. This will make, when finished, a valuable addition.

Mr. C. E. Stafford is superintendent of the open hearth furnace. He is a gentleman of taste and culture, and, we should judge, very faithful and efficient.

The following are clerks in the office of the General Superintendent, upon the grounds. The first office was destroyed by fire and the old boarding house is used.

The names of the clerks are: Michael W. Parsons (Superintendent's clerk), from Nov., 1875; Mr. Eben Bent (chief clerk), from April, 1879; Mr. O. Bellman, from Nov., 1867; Mr. E. G. Anderson, from July, 1875, Mr. Mortz Metzgar, from Jan., 1876; Mr. Jos. Newlin, from April, 1878; Mr. Edward Macgregor, from April, 1873, to 1878; Mr. Jas. Potts, from April, 1867, to April 1, 1879. Mr. Potts was thus in the employ of the Company from almost its beginning. He was a very faithful officer. As a man he was much admired for his courtesy, and industry in Christian work.

Mr. William W. Neeley has charge of the rails after they leave the rolls. He is general rail inspector of the Company, assisted by others. The rails are inspected and appropriately marked. Some of the patronizing railroads furnish their own inspectors. There are two time-keepers, who alternate their work. These are Mr. J. E. Nace and Mr. C. P. Baker. These gentlemen have to pass constantly through all parts of the Works, and keep a written record of all hands employed. Their trust is a very arduous one. They must exercise sleepless vigilance. They must report all offenders; all persons found asleep. To follow them in their constant round for a day, or a night, would be enough to show that their office is no sinecure.

From an official report made by the Superintendent of the Pennsylvania Steel Works to the State Secretary of Internal Affairs, but a short time since, we find (p. 607,) the number of men employed given as 1,656. The division and wages paid are as follows: In the converting department, 285 men, \$1.50 per day, and 5 boys, 50 cents; mill department, 390 men, \$1.75, 18 boys, 60 cents; steam machinery, 75 men, \$1.60; machine shop and foundry, 230 men, \$1.60, 3 boys, 60 cents; carpenters, 70 men, \$1.20; laborers, 580 men, \$1.00.

We believe since this report was made there has been a slight reduction in the wages of the men, but these figures will afford a fair statement of the distribution of labor, and the amount of remuneration received in the various departments.

Our assigned limits will not allow us to

detail at large each man, or each person holding a position of trust in the vast works of the Pennsylvania Steel Company. This would be a pleasant task if we had space and leisure, for there is perhaps not a person employed but of whom something commendable could be written. They are all very largely selected men, men who have been tried, where good qualities have been discovered, and who, therefore, are in a class of merit, and many of whom have begun low down in the grade of labor, and who by their industrious efforts have arisen in the line of promotion. There are some who have been in the employ of the Steel Works for a period of fourteen years, or from the beginning. They certainly have been faithful to their duties. And, again, the time of the men is so thoroughly employed that there is no leisure for prolonged seasons of intoxication; pre-occupation prevents a waste of time and confirms many who else might be irregular in their habits. We do not say that all the employees are temperance men from conviction or habit, but we do affirm that there are few places where as large a number of persons are employed and so little drunkenness is found as at the Pennsylvania Steel Works. In addition, the strict rules of the Superintendent has contributed much to this blessed result.

In the absence of a more detailed personal statement we purpose to note a few observations which will apply generally to all the employees of the Steel Works. Time after time we have stood and watched the throng as they have left the Works at the close of the toil of the day, and have repeatedly been impressed with their age. There are very few old men. There are many young men, and a few boys. The majority are in the prime of life. They are full of the vigor of a completed manhood. They are, most of them giving the Company the best work of their lives. They have the experience of years, and fullness of vitality, and the strength of specialties—kinds of work for which they are best suited. These men are not all Americans by birth. They have

passed their childhood in many lands. Numbers of them have crossed the ocean. They are not all Protestants. There are some who are unbelievers. But they all work pleasantly together, and we do not hear of feuds or jealousies because of race or creed. There is a general spirit of harmony prevailing among all the men. The wages of the men have been reduced, and some have thought the reduction unjust, but whatever the thoughts of the men may have been there has been no riot, or mutiny, or strikes. The men have continued faithful to the Company.— Sometimes they have performed their tasks so as almost to surpass the powers of human endurance. They have done this voluntarily. The community have been full of admiration for the pluck and earnestness manifested.

The spirit of brotherhood has been exhibited in times of adversity. When affliction has come to some one employed, by accident, or sickness, or death, there is when needed, and the fact is known, a most generous response. It has been remarked that the most generous men in the world are those employed in iron works, when their hearts are once touched in sympathy for human suffering. And we think we venture nothing in saying that the employees of the Pennsylvania Steel works are not lagging in generosity behind any men of their class in the State.

It was a remark made by Abraham Lincoln, in some of his public documents, that in the Army and Navy of the United States there were persons qualified to fill any place in the Government. A similar remark could be offered in regard to the employees of these works. There are men in every department who could be much advanced, and they would continue to exhibit the same faithfulness and efficiency. When we compliment their ability we speak from personal knowledge. There are those who are proficient in music, in mathematics, in literature. We rejoice in the nobility of labor. Labor is not of necessity degrading. Idleness is stagnation, but normal, healthy labor is beneficent, and brings its reward. The

diversity in the condition of humanity which is common to all parts of the world is seen here. Some are prodigal, some are harassed by their past improvidence, some are crippled by sickness in their families, and then those who have saved year by year, and have houses and lots purchased by their economy and industry. It is pleasant to watch them as they quit for the day and with their empty kettles hasten homeward. They carry with them their love of life, and of home. They share the responsibilities of probation, and they await the retributions of approaching throne.

"Each spirit weaves the robe it wears
From out life's busy loom,
And common tasks and daily cares
Make up the thread of doom."

BALDWIN.

The territory now occupied by the town of Baldwin was once the site of an Indian encampment. In making excavations for the railroad switches, Indian skeletons have been exhumed. Indian arrow-heads and darts of flint stone are frequently turned up by the ruthless ploughshare and are quickly gathered and securely preserved by numerous relic seekers. There are many persons in this locality of antiquarian proclivities. When a number of skeletons were discovered a few years since not far from the Company's office, they were very much decayed, but among the number the best preserved was selected and forwarded to the Secretary of the Steel Company at the time—Dr. Lambertson.

In the life of the Rev. David Brainard, who became a missionary among the tribe of the Susquehanna Indians, in the summer of 1746, it is related that he visited that part of the tribe residing here, and remained all night with them. Captain John Smith, of the Virginia Company, ascended the Susquehanna to within a few miles of this place. (See Historical Narrative by Mr. J. R. Orwig, Assistant State Librarian, p. 24.)

The Susquehanna Indians are supposed to have originated from the Leni Lenape. (From the "History of the Indians of the

United States," edited by Mr. Schoolcraft and published by the United States Government, we gain most of our knowledge of the Indians. This is a celebrated authority.) They emigrated West from the Hudson River and discovered the Delaware and Susquehanna Rivers, and settling by them in time took the name of the rivers. This information is found in a "Historical Sketch of Dauphin County," published by the County Commissioners in 1876.

The Susquehanna River is about 400 miles in length. It reaches from its source in Otsego and Canandaigua Lakes, in Western New York, to the Chesapeake Bay, into which it empties at Havre de Grace, in Maryland. The Unadilla and Chenango Rivers empty into the Susquehanna. They are in the State of New York. In Pennsylvania, it receives the Pittston, the Tioga, the West Branch and the Juniata, and from their junction it is 153 miles to its mouth. It is a shallow, rapid, mountain river, with varied and romantic scenery. Vast quantities of timber are floated down in the spring freshets. Near the mouth it is famous for water fowl, especially the canvas-back duck, and has important fisheries. There are traditions that near the three islands opposite Baldwin, now owned by Mr. Peter Stuckers, Mr. Daniel Sheesleys and Mr. Peter Day, there were, in years gone by, a plenteous supply of shad, which were caught in seines.

The character of the Susquehanna River is such as to render it unnavigable for steamboats requiring much draught of water. Efforts have been made to provide for navigation. As by the Constitution Congress has control of all inland water (Sec. 8, paragraph 3), the citizens of Harrisburg, in 1826, memorialized Congress upon this subject. A committee was sent to Washington to present the claims of residents along the Susquehanna. Their efforts were successful in part. Congress passed a bill ordering a survey to be made. It was claimed by the advocates of the bill that the scheme of rendering the Susquehanna navigable for boats of large size up as far as Harrisburg, was eminently practi-

cable; that an expense on the part of the General Government of five million dollars would suffice to excavate all places of insufficient depth and to canal about the falls, and that in the increased revenues of the country which would thereby be secured there would be ample remuneration. There were persons who were sanguine of success. Three small steamboats were launched upon the river as experiments, in April, 1826. They were named the Pioneer, the Cododrus, and the Baltimore & Susquehanna. There are those now who believe that this would yet be accomplished were it not for the competition of Philadelphia on the Delaware, which has prevented it. But for this it would, doubtless, soon be done.

The original road from Philadelphia to Pittsburg ran through Baldwin, near the river. This was the first road to Lancaster. It ran about two rods east of the road-bed now occupied by the tracks of the Pennsylvania railroad. This road was the great thoroughfare to the West. Along it rolled those ponderous wagons which have received the appellation of the Conestoga wagons, by which they are vividly recalled by all of the old residents of the vicinity of their journeys. They were large, and capacious, and strong. "The opening of turnpike roads originated new methods of conveyance, the most important of which were these Conestoga wagons, as they are still locally called—immense four-wheeled vehicles, arched over with sail-cloth coverings, and drawn by six powerful horses, each provided with a row of small bells adjusted above the hame-heads of their harness. These, in time, monopolized the entire carrying trade between the city and country merchants; and beside the professional teamsters, nearly every well-to-do farmer in the country was more or less engaged in the business, the latter, however, generally carrying their own produce to the cities and returned ladened with goods for the country merchants." (History of Dauphin County, p. 104.)

Along either side of this road as it passed over what is now owned by the Pennsylvania Steel Company there were

large, beautiful locust trees. Under their friendly shade, as they grew to vast proportions and strength the jolly, rollicking teamster often reined or called with the crack of his whip his horses wearied with their long journeys, and there was doubtless many a heart full of gratitude as it throbbed refreshed by the welcome shadows of these trees. This road by the river was vacated in 1821. Then came the work of the iconoclast. Mr. Rudolph F. Kelker remembers these trees and assisted in cutting them down. They were manufactured into posts, and used for various other purposes.

In 1797 stages ran from Harrisburg to Lancaster. The fare was \$2.00.

The turnpike from Middletown to Harrisburg was constructed in 1815. This was a distance of nine miles. The cost was provided for as follows: Individual subscriptions, \$21,000; State subscriptions, \$14,000. Cost per mile, \$5,000; original price of share, \$50.

The Harrisburg, Mount Joy & Lancaster Railroad was opened in 1836.

In this connection we will mention that the first person running a passenger coach between Baldwin and Harrisburg was Mr. Sanders. He was succeeded by Mr. Sholl. The Harrisburg City Passenger Railway Company extended their line to Baldwin in 1875. The first trip was made on July 12, of that year.

We should mention that just below the ground now occupied by the Steel Works there was a ferry for the transportation of passengers and teams and vehicles. They were towed over in large flats. This was called Chambers' ferry. The public road below Lower Baldwin, running out to Churchville, is the old Chambers' ferry road to Carlisle and on to Pittsburg. Teams going west crossed here, as they saved some distance from that occupied by the route which led over Harris's ferry, farther up the river. This Chambers' ferry was remunerative, and was rented for a French crown a day. Through many generations these ferry privileges were preserved, and in all subsequent sales these ferry sites have been reserved. These rights are now

vested in Mr. Rudolph Kelker, of Harrisburg. They embrace land upon both sides of the river, and at any time, if circumstances should demand, or Mr. Kelker should choose, he could again re-establish the old Chambers' ferry.

Dauphin County was created by act of Assembly, March 4, 1785. "The county derives its name from the Dauphin of France, the eldest son of the king, as a token of regard for the assistance rendered by his father, Louis XVI., to the Americans during the Revolution."

At the September session of the Court, in 1799, commissioners were appointed to lay out the line for Swatara township. These commissioners made their report, which was confirmed by the Court. A new line for this township was ordered by the Court in 1842. The report of the commissioners appointed was confirmed by the Court, January 18, 1843.

Baldwin is situated in Dauphin County, Swatara Township. We now approach the origin of the town of Baldwin. In 1866, within the territory which would now be embraced by the probable lines of a survey if Baldwin should be incorporated, there were only six families residing. Contrast that time with the present, and the reader will be able to form some conception of the rapidity with which the town has grown. It has been no mushroom growth, but quietly, steadily onward from the beginning. The Pennsylvania Steel Company were organized and prospecting for a site for their contemplated Works. There is a tradition that a Board of Directors came by a special train and examined the land now occupied by them. The object of their visit was not surmised. A few weeks afterwards Mr. Rudolph F. Kelker and Mr. Henry A. Kelker were approached and solicited to make sale of the land. This, at first, they hesitated to do. It was a heritage from their father. In their boyhood they had worked upon the land. There were many fond associations connected with it. They desired to transmit it to their children. They had refused many offers for it. They had had it in the possession of the family for a long time, and

in unbroken succession the title deeded to it from the first. It was covered by a warrant to Thomas Renick, bearing date of March 27, 1730, and by a patent to Richard Peters, bearing date of March 19, 1747, "a tract of land in Pextang Township, Lancaster County," from the Supreme Executive Council, the Acting Government for the State. From this time down, the title deeds are now preserved by Mr. Kelker. Mr. Frederick Kelker, the father of Rudolph and Henry Kelker, purchased the first tract of land of the heirs of Mr. John Snively, April 1st, 1830, paying at the rate of \$37 per acre. Another tract was purchased by him of the heirs of Mr. Felix Sanders in 1843.

One day looking out upon the broad, fertile meadows, Mr. Kelker remarked to his son Rudolph: "You ought to lay out those meadows in building lots, they will be needed." When Mr. Kelker replied to his father that he would keep the land as it was, he desired it so. The venerable man, with some insight into the future, replied: "Rudolph, I shall not live to see it, but you will, when those meadows will be covered with dwellings." And to the anticipation has been realized.

When Dr. Lambourn, for the Pennsylvania Steel Company, observed what was to be the character of the works they intended to construct, Mr. Kelker consented to transfer the land to them. The matter was noised abroad. Public interest was awakened. Different places desired the works to be located near them. There were gratuitous offers of land. Competition was strong. At Harrisburg subscriptions were invited. A mass meeting of the citizens was held in the Court House. Impromptu speeches were made. The majority were in favor of locating the Works below Harrisburg. The amount of land purchased by these contributions was as follows: From Mr. R. F. Kelker, 38 acres and 134 perches, at \$300 per acre. From Mr. Henry A. Kelker, 43 acres and 114 perches at \$300 per acre. The line extends from the center of the canal to the river at low water-mark. The deed was given January 8, 1866. The

cable amount was estimated at \$24,577.50. Subsequently the Company purchased with their own means, from Mr. R. F. Kelker, 15 acres and 52 perches at \$300 per acre. The amount paid for the last purchase was \$4,597.50. The total cost of the land therefore may be estimated at \$29,175.00. This does not, of course, include the recent purchase of land from Mr. Henry Gilbert. As a matter of interest to posterity we proceed to transcribe the names of the original subscribers who paid their subscriptions as indicated.

The following list is copied from the original subscriptions:

NAMES OF PERSONS WHO PAID FOR THE LAND PURCHASED OF MR. RUDOLPH F. KELKER AND MR. HENRY A. KELKER, AND WHICH WAS PRESENTED TO THE PENNSYLVANIA STEEL COMPANY.

J. D. Cameron	\$4,000 00
Henry A. Kelker.....	3,778 75
Rudolph F. Kelker.....	2,358 75
William Calder.....	1,000 00
Simon Cameron.....	1,000 00
First National Bank.....	1,000 00
Harrisburg National Bank.....	1,000 00
by wagon, Mumma.....	1,000 00
Alexander Koser.....	1,000 00
Walter L. Trevoick.....	700 00
Peter Stucker.....	700 00
Immanuel M. Kelker.....	500 00
Geo. Trullinger & Co.....	500 00
Jacob R Eby.....	500 00
John B. Simon.....	500 00
Aaron Bombaugh.....	500 00
Daniel Sheesley.....	500 00
Geo. Bergner.....	500 00
D. W. Gross & Co.....	250 00
A. Boyd Hamilton.....	200 00
W. O. Hickok.....	200 00
Henry Booser.....	125 00
(Henry Booser afterwards refused to pay, and the same was paid by Henry A. Kelker.)	
Jacob Boyer.....	125 00
Jacob Eshenaur.....	100 00
Isaac Mumma.....	100 00
Jacob Reel	100 00
Wm. Parkhill.....	100 00
Samuel S. Rutherford	100 00
Christian E. Hess.....	100 00

David Ober.....	\$ 100 00
Joseph Rudy.....	100 00
Bigler & Son.....	100 00
Martin Wetzell.....	100 00
Fager & Maeyer.....	100 00
Thomas I. Weidman.....	100 00
Henry Brown.....	100 00
Jacob C. Bomberger.....	100 00
Weidner W. Boyer.....	100 00
D. Eppley & Co.....	100 00
Geo. J. Bolton.....	100 00
Lewis Koenig (Chest. St.).....	100 00
Abner Rutherford	100 00
B. S. Kunkle.....	100 00
J. B. Rutherford	100 00
J. & J. K. Greenawalt.....	100 00
Robert Tippet.....	100 00
Jacob S. Haldeman.....	100 00
Michael Frantz	100 00
J. J. Bishop.....	75 00
Jacob Bender.....	75 00
Martin Good.....	50 00
Charles F. Muench.....	50 00
Henry Opperman.....	50 00
John Myers.....	50 00
John Dellar.....	50 00
L. Koenig (Paxton St.).....	50 00
Philip Leim.....	50 00
J. Brisbin Boyd.....	50 00
J. Adam Frederick.....	50 00
Wm. Bishop.....	25 00
W. S. Shaffer & Bro.....	25 00
Theo. F. Scheffer.....	25 00
John Hoffer.....	25 00
Christian Snavelly.....	25 00
Daniel Leedy.....	20 00
John Sautter.....	20 00
George Fearster.....	10 00
George Keil.....	10 00
George Hermansdorfer.....	10 00
Ensminger & Adams.....	10 00
George Winters.....	10 00
Carl Bucher	5 00
H. Shrenk.....	5 00
S. Huntsberger	5 00
Dickel & Treida.....	5 00
C. Forney.....	5 00

Making a grand total of.....\$24,577 50

In counting over the list, we find the number of persons contributing to be seventy-six.

Having sold so much of their land for the Pennsylvania Steel Works, Mr. R. F. Kelker bought some land—forty-five acres from Mr. Abraham Wolf, and twenty-two acres from Mr. Jacob Bender, and fifty acres for his brother, Mr. Henry A. Kelker. Having completed their purchases, Mr. Kelker commenced to lay out building lots, and offering them for sale. They were sold only to persons intending to build, and not with a purpose to advance the plans of land speculators.

This land was the first laid out, and was done by Mr. R. F. Kelker in person. These lots were in what is now known as Lower Baldwin. This surveying was done in April, 1866. Arrangements were made to have streets fifty feet in width, and alleys twenty feet, and each lot to front on a street and also on an alley. The prices received for these lots varied from \$100 to \$250 per lot, according to location.

Mr. Henry A. Kelker immediately afterwards commenced to lay out lots in what is called Central Baldwin. The line between Mr. Henry A. Kelker and Mr. Rudolph F. Kelker ran at the fence below the drug store now kept by D. B. Traver, M. D. From the river back along this line their land extended one mile and one-eighth.

Adjoining the land of Mr. Henry A. Kelker was the farm of Mr. Walter L. Trevoick. A part of this was sold to the Pennsylvania Steel Company. The remainder was purchased by Mr. Charles L. Bailey, of Harrisburg. We believe he made no improvements, but sold out to Mr. Josiah Dunkle.

The first buildings erected by private parties were erected by Samuel Whitmoyer. From this on to the present, houses have been constantly erected, some as private residences and by individuals owning them, and there have been several enterprising individuals, not residents, who also builded houses and rows, for the use of tenants. These rent at a good rate of interest, and are always in demand. A comfortable house does not long remain empty. There are constantly persons waiting for an opportunity to rent.

It would be interesting to give the date of the erection of each building, but this would require a vast deal of research and perhaps would not be appreciated by the general reader.

After the location of the Steel Works, the officers of the Company conferred with Mr. Rudolph F. Kelker as to the name of the prospective town. This was eminently befitting, as the land had been purchased from the Kelker brothers. This was their opportunity. They might have transmitted their name in the immortality of Kelkerton, or of Kelkerville. That they were unselfish is seen in the honor being bestowed upon another. They suggested the name of Mr. Matthew Baldwin, a distinguished philanthropist, and the founder of the Baldwin Locomotive Works at Philadelphia. And the town has borne this name until this time. The name has presented difficulties which perhaps were unforeseen. There is a town in Allegheny county called Baldwin. There is a postoffice in Butler county called Baldwin. They were both in Pennsylvania. When the need of a postoffice arose, the name that was chosen was Steel Works. The name of the first postmaster was Mr. Joseph Meredith. He was appointed about 1871. He was succeeded by Mr. Joseph A. Work.

Recently there has been considerable discussion as to the propriety of changing the name of the town so as to have uniformity. As it is, the railroad station is Baldwin, the postoffice Steel Works. The general direction of the Susquehanna river is southeast. The Steel Works are situated between the river and the canal, on a level tract of bottom land. Baldwin is separated from the Steel Works by the canal. It is divided into Lower, Upper, and Central Baldwin. It is situated mainly on the turnpike running from Harrisburg to Middletown. It spreads out for a distance of nearly a mile. This turnpike runs parallel with the canal. There are some streets which are laid out and which run back upon the adjoining bluffs at nearly right angles with the pike. They again are intersected with a street running

parallel with the pike. These are lined with buildings to a considerable extent. There are also several residences upon the hills or bluffs overlooking the town from which an extensive survey of the country may be made. The country from this height is exceedingly beautiful. The Steel Works are in full view, and there is a noble outline of country varied and picturesque visible on the opposite side of the Susquehanna. There are the mountains in the distance, lifting their heads against the sky at the extremity of the horizon, and bounding by their height the breadth of vision. The panorama is dotted with the village of New Market in York county; adjoining this is the prosperous borough of New Cumberland in Cumberland county. From Upper Baldwin a road runs out over the hills. This was laid out by Mr. Josiah Dunkle. A few rods up from the pike, on a little eminence, is a cluster of houses which rejoices in the progressive name of Hygienic Hill. There is no hygienic institution, however, erected here. Neither are the residents all invalids, as might be supposed. Neither do they all partake daily, and continuously, and exclusively, of yeastless bread, and pepperless victuals, and lardless pies, and coffeeless cups. And yet truth as an impartial historian compels us to record that there is a kind of superstitious mythical worship given at the shrine of the goddess Hygiea. There is no temple erected to her honor as yet, though it is claimed that the air of Hygienic Hill is more balmy and salubrious than that which blows upon other parts of Baldwin.

A little farther up the hill and the scenery is most charming. There is a full view of Harrisburg—the asylum, the arsenal, the capitol, the water works, and the smoke of the furnaces; and on up to Fairview, up to where the Blue Ridge is divided by the Susquehanna; Bridgeport and Fort Washington. From the river the eye may sweep over a country which at this season is appalled in the most lovely garment of Nature—the verdant fields, the trees rejoicing in the freshness and beauty of their new foliage; spacious residences

embowered amid the loveliness of cultivated shrubbery; bursting blossoms and fragrant flowers; the sheen of the river as like molten silver it rolls downward to its kindred waters; on down to Highspire, towards Middletown. Here is a broad expanse of town and country; of gardens and forests; of mountain and plain. It is glorious scenery, when it is illuminated by the gorgeous rays of the setting sun—its shadowed ravines, its ridges burnished with gold, its meadows reposing in the mellow light, the rising murmur from the hum of an unceasing industry, form a scene of incomparable interest.

This world is wondrously diversified. It is so in nature. It is so in Providence. Up Hygienic Hill the sorrowing cortege passes to the home of the dead. It is but a short distance from the pike to the Baldwin cemetery. This consists of four acres of ground which have been laid out by Mr. Josiah Dunkle in streets, and with lots nine by twelve feet, ranging in price from \$10 to \$20. A comfortable brick house for the residence of the sexton, is upon the grounds. This cemetery bears the date of 1876. It is eligibly situated. As the bereaved relatives and sympathizing friends return and lift their eyes upon the beauties of the landscape which we have described, to the vision of faith it may become a type of that world of infinite beauty where the ransomed of the Lord rejoice forever.

“Then shall the good stand in immortal bloom,
In the fair gardens of that second birth;
And each bright blossom mingle its perfume
With that of flowers which never bloomed on earth.”

The educational interests of Baldwin have not been neglected. The school house in Lower Baldwin was first erected at the commencement of the free school system in the State of Pennsylvania. This was torn down and a new brick school house was erected in its place quite recently. The first new school house for the accommodation of a newly organized school, was at the opening of the ravine south of Hygienic Hill, called Cooney Hollow. This was erected in the year

1870. It continued as a mixed school until the fall of 1878, when it was reserved as a school for the negro children of the place. The school house in Central Baldwin, or Second street, was erected in the year 1873, and consisted of one room. It was raised to a two-story building in 1875. A double house was built to it in 1877 and the upper part was furnished of the old building. This is the largest public school building in town, and at present there are three teachers, Messrs. Jacob G. Eschenhour, A. L. Hummel and Miss Jennie Stoner. The Ewington school house was built in 1877. The sessions have been taught by Mr. P. J. Daron. The teacher of the "Cooney Hollow" school house is Mr. E. L. Carey.

Baldwin very much needs a central graded school with a standard as high as the public schools of the city, and with power to thoroughly examine the students and to grant diplomas of merit to the deserving ones. In the absence of this, there are some who attend the schools of Harrisburg. But this will come in good time, and on the hill in the distance we have noticed a very available site.

Baldwin has five churches. The Methodist Episcopal Church was organized about 1868. The first building was erected on the grounds of the Steel Company, opposite the blast furnace, on the road leading from Baldwin to the depot. While the building was in course of construction, there was preaching in the dining room of the boarding house, the building now occupied by the Company's offices. This church was subsequently removed and rebuilt on its present site on the turnpike, in the year 1877. The following ministers have been stationed as pastors: Rev. John Stringer, Rev. Wesley C. Johnson, Rev. John W. Sayres, Rev. John A. Cooper, Rev. Thomas M. Jackson and Rev. John H. Wood. The Sunday-school was organized in June, 1869.

The Evangelical Lutheran Church was organized in 1875. This church in Central Baldwin was built in the year 1875. The pastors of this church have been Rev. Edward Daron and Rev. Samuel Yingling.

The Sunday-school was organized in 1874.

The United Brethren Church was organized in 1874. The church is called the Centenary. The following ministers have been pastors: Rev. L. Peters and Rev. Henry C. Phillips. The Sunday-school was organized in 1874.

There is in Cooney Hollow, where most of the colored people reside, a two-story African Methodist Episcopal Church. This was built in 1874. The pastor is Rev. John C. Brock. The Sunday-school was organized in 1873.

In the year 1878 the Roman Catholics built a church in Upper Baldwin, on land purchased of Hon. J. Donald Cameron. The pastor is Rev. M. C. McBride. They have also a Sabbath-school.

There is a very flourishing Young Men's Christian Association. Its first President was Mr. Joseph Potts. He filled this office for a year. At his removal Mr. Joseph A. Work was elected. There are about fifty active members, and also a large list of contributing members. The meetings are held at present in Association Block, Ewington. The Association was organized in 1878.

Baldwin has a flourishing branch of the American Bible Society auxiliary to the Dauphin County Bible Society. This was organized in 1878. The first President was Mr. J. G. Kellar. D. B. Traver, M. D., has been recently elected President. The Depository is in charge of Mr. J. A. Work.

A "Reformed Men's Club" was organized in 1875. Under its auspices many union services have been held and some very able addresses by distinguished speakers have been delivered. The number who have been persuaded to sign the Murphy pledge is not far from six hundred. The amount of money expended to defray expenses has been about fifty dollars. For these services the churches have always been open, and the attendance uniformly large and intelligent.

There are many of our citizens who are attached to secret societies in Harrisburg. There is only one lodge in Baldwin—the I. O. O. F., No. 1901. It was organized in 1878. Its meetings are held in Associa-

tion Block, on Myers, street, Ewington.

The first physician located in Baldwin in 1869—L. B. Christman, M. D. He died in 1873. The first drug store was established by Mr. W. D. Martin. He was succeeded by Dr. D. B. Traver. There is now another drug store kept by Mr. Jacob M. Hess. The following physicians are located in Baldwin and practicing at this time: D. B. Traver, W. H. Seibert, J. W. Brown, J. B. Saul, M. B. Madden, Bayard Dickinson, and one in Ewington—George H. Seibert. And beside these there are some of the physicians of Harrisburg who are occasionally called to visit patients here. Then there are some itinerant doctors who practice without diplomas,—carpet-baggers,—who appear about pay-day, and as quickly disappear, only to reappear in time for the next “pay.”

There is one dentist, Mr. Samuel Matthews:

We have no resident lawyers, and so Harrisburg has the monopoly.

We have two Justices of the Peace, Mr. Christian E. Hess and Mr. Charles H. Babb.

Some of the people attend market in Harrisburg, and there are hucksters who vend their goods through the streets, still Baldwin can boast of a very large market house. This was erected in 1878 by the Market House Company. The cost of the building, which is of brick, and of the ground, is estimated at \$8,000. All the stalls are taken, and there is a demand for more room. The Company owning it have been talking of enlarging it. This is to Baldwin, in addition, what the opera house is to a city—a place where fairs and festivals, shows and entertainments, and everything of that sort is held. Baldwin needs a good lecture hall. This the Market House Company propose to furnish by raising the roof of the market house and making the hall up stairs. It is to be desired that this be accomplished soon.

Baldwin has a large furniture and hardware store kept by Messrs. Dunkle & Co.; a coal yard kept by Mr. Samuel Couffer; a lumber yard kept by Mr. Jacob Fackler; there are two undertakers—Mr. Jacob Fackler and Mr. Isaac Beinhower; there is

a jewelry store kept by Mr. Frank Morley, he also keeps stationery and confectionery. There are several grocery stores and candy and toy stores. There is a sale and exchange stable for horses. There are four barber shops. There are four hotels. There are also green grocery stores. There is a stove, tin and hardware store kept by Mr. N. S. Fencil. There is a cigar factory. There are several shoeshops and one complete shoe store kept by Mr. F. C. Earnest. There are three resident butchers, and others who come from neighboring towns. There is a baker situated in Lower Baldwin, and one from Middletown and also one from Harrisburg, who come here. There is a blacksmith shop and a wagon shop. There are several painters. An ice wagon makes its daily circuits to refresh the thirsty. A livery stable is kept by Mahony & Wood, and one by Mr. J. B. Litch. Horses are also loaned by other persons.

One of the largest stores in Baldwin is that of Mr. J. B. Litch. His stock consists of general merchandise.

The largest store in town is that of Mr. George Bent, Agent. It is superintended by Mr. Joseph Meredith. It is upon the Pennsylvania Steel Company's ground. This store furnishes nearly everything needed by the families of the employees of the Works. It has dry goods, groceries, provisions, coal and wood. It employs a tailor and a shoemaker. Its business per annum we should estimate to be not less than \$125,000.

The lists we have given furnish only a partial idea of the amount of trade done by the inhabitants of Baldwin. A large number of the citizens take advantage of the omnibus and go to Harrisburg, where the variety is larger, and make their most important purchases. This habit is, of course, injurious to home trade, but while we receive no credit for it at Baldwin, there are business houses in the city who depend greatly upon their trade from Baldwin. Thus Harrisburg is receiving back what it gave with abundant interest.

The inhabitants of Baldwin are omnivorous readers. The mails are freighted

with various kinds of literature. While there is much of the flashy kind, there is also a large sprinkling of that which is healthy and nutritious. While there are vast quantities arriving by mail to regular subscribers—newspapers, magazines, etc.,—there is a large amount purchased weekly at the news offices. There are several hundred subscribers to daily papers which are delivered by carriers throughout the town.

Baldwin has also a newspaper of its own—*THE ITEM*. At present it is published as a weekly. There is no reason that we can see why it should not be published as a semi-weekly, at least, and, personally, we should be pleased to have it established upon a sound remunerative basis as a daily. There certainly is sufficient population in Baldwin and in the little villages contiguous to it to give at least a subscription list of three thousand to commence with. In this every citizen should be interested. It fosters local attachment. It develops home trade. It is a bulwark for society, and, if honestly wielded, it may become a power behind the throne; give tone to the community, direct public enterprises, and inspire public effort to gird itself for yet greater successes. The large number of dailies circulated here published at other places indicate the demand. We trust a supply may soon be afforded by a Baldwin publishing house.

THE ITEM is edited and published by the Work Brothers—Joseph A. and James W. It has quite a respectable subscription list. It is printed on a Fairhaven press. It was established in April, 1875, with French & McClure publishers. The form has been changed three times. It was at first only four columns and four pages. Then it was changed to five columns. It has now four pages, and six columns to a page. The name at first was "The Token of Progress." The name was changed in May, 1878, to *THE WEEKLY ITEM*. The publishers are contemplating still further changes in the size of their paper, as the patronage received from the public may warrant them to make.

For the benefit of our readers we will

relate an interesting little episode connected with the war of the rebellion. In the dark days of the war, when the rebel scouts were within two miles of Harrisburg, a party of soldiers were sent to Baldwin. This was in July, 1863. They were quartered in a barn which stood near where the machine shop now stands. These 150 volunteer soldiers were to prevent the rebels from crossing the Susquehanna at this point. As Gettysburg is not more than thirty miles distant in a direct line, this would not have been surprising. Cannonading was distinctly heard here during the battle of Gettysburg. This company was under the command of Capt. W. Y. Foster, of Harrisburg. Numbered among the high privates were the present ticket agent, Mr. Lucian Barto, and J. B. Ewing, Esq. Two New York regiments lay back upon the hills, to be used in case of an attack. But the Union forces were victorious at Gettysburg and in a few days the company was recalled. That they were here ready for an emergency which should demand their service exhibited their loyalty to their country, and the spirit of patriotism which animated them. Baldwin has, therefore, connected with its history a reminiscence of the war waged to maintain the nation's existence. And may Baldwin never cease to be filled with men who shall be inspired with a like patriotic devotion, ready to die to maintain unsullied the glory of its shining stars and its crimson stripes.

Above the Steel Works, on the river, is the prosperous little village of Ewington. This is properly a part of Baldwin. It is one of the fruits of the Steel Works industry. It has received its name from that of the principal partner of the firm which purchased this tract of land, and who have contributed so largely to the success of their colony. There is Upper and Lower Ewington. Upper Ewington consists of about thirty acres of land purchased by Messrs. Ewing & Co. From this some land was sold, and the cluster of houses which rejoice in the name of Mummatown was built. Lower Ewington consists of about forty acres purchased of Mr. Walter A

Trevoick, by the firm of Ewing, Purdy & Co. Mr. J. B. Ewing is a member of both firms. He is a lawyer residing in Harrisburg. He often visits his town. He is sanguine of its future. Col. A. L. Purdy is also a lawyer who resides at Sunbury, Pa. He has served two sessions in the Legislature. The remaining member of the firm is Hiram Long, M. D., a resident practicing physician of Sunbury. Mr. Purdy and Dr. Long are also frequent visitors of the town.

The price paid for the land destitute of all buildings, save a farm house and barn, was a thousand dollars per acre. The deed was given in April, 1876. Now in Ewington there are a hundred and thirteen two-story houses and forty-seven three-story houses. In consideration of the hard times which have prevailed throughout the country during this period this may be regarded as a rapid growth. The prospect for the future is yet more flattering. The survey of Ewington was made by Capt. ——— Boine, the draft from which exhibits a very fine piece of drawing. The site for the town was laid out in streets, and building lots. There are five streets running parallel with the river. These are Christian, Myers, Second, Frederick and Furnace streets. Furnace street has now been destroyed by the building of the Philadelphia & Reading railroad extension, the line of which runs through it. The streets crossing these, running from the river to the canal are named Calumet, Trewick, Conestoga and Francis streets. A ready sale has been found for many of the building lots. The schedule of prices as found on a printed estimate before me as I write fixes corner lots on Myers and Second streets at \$400; corner lots on Christian, Frederick and Furnace streets at \$500; corners on Avenues on Christian and Frederick streets, at \$400. Inside lots on Christian, Frederick and Furnace streets \$300. The terms of payment are five per cent. of purchase money down and the balance in ten equal semi-annual payments.

It is believed by many persons that in

time Ewington will be the most prosperous and desirable of all sections of Baldwin for business sites. It has many facilities for business. It is between two railroads. It is compact. It is so level there will be no expense for grading. It is systematically laid out. It is represented by a firm of characteristic push and sagacity. In the past year more houses have been erected than in all the other sections of Baldwin added together. This will, doubtless, continue to be so for the present year, and for several successive years to come. One reason for this exists in the fact that in other parts of the town eligible lots are scarce, and the prices demanded thought to be by many exorbitant. But prices must advance as the supply diminishes. It has seemed to me that the organization of a Building and Loan Association would be for the employees of the Steel Works, and for the citizens generally, a very profitable investment. If it were honestly managed, in a few years comfortable homes could be secured at a comparatively easy annual or monthly economy. Mr. W. M. James is the resident agent for the Company.

A favorite resort in the summer is Machen's Island. It is now leased by Mr. C. L. Boyer, proprietor of the Temperance Hotel, Harrisburg. Mr. Boyer is a Christian gentleman and a great friend of the boys. This island is opposite Baldwin. It is fitted up with seats, swings, and all the accessories for a picnic. Each summer there are visits from Sabbath-schools, Fire companies, Lodges, etc. It is becoming a fashionable resort. And when there are no special attractions, Mr. Boyer on moonlight evenings, often comes down with his steamboat, the "James W. Wier," crowded with excursion parties, who pay a short visit to the island and saunter under the trees, enjoy the pleasant walks and return full of glee to the Capital City.

Baldwin has yet another attraction. To the right, as you pass from Baldwin to Harrisburg, are the spacious farms of Hon. J. Donald Cameron. The line of Harrisburg runs through the iron gates at the entrance to what is called the lawn.

HISTORY OF PENNA. STEEL WORKS.

There are seventeen acres of land laid out with the most exquisite taste. Concealed amid the shrubbery are the remnants of what tradition ascribes to be an old fort, erected to protect the settlers from the incursions of the Indians. It is situated on a little knoll. It is constructed of stone in masonry. It is seven feet high, the top arched. There are several portholes on each side. Some of these have been walled up, but a few remain. They are small on the outside, but large inside, so as to admit of the largest range with the least possible exposure. Over the fort a log house was built which is still standing. The design of the fort and house are very evident. It was one of the stratagems of the Indians to burn a house so as to capture the inmates as they sought to escape. Here was a provision to anticipate this danger. Were the house discovered suddenly on fire they could retreat below and thus still defeat the purpose of the Indians. The house itself is a curious piece of workmanship. The timbers which support the roof would seem to indicate that the master architect was a ship carpenter. This house is undoubtedly ancient, and, though much antiquated, is in a tolerable degree of preservation. It has been sketched by an artist, but its history is unwritten. Could we give it a voice that it might speak to us, what volumes of information might it furnish us concerning its inmates, its associations, and its origin. Mr. Cameron preserves and visits this relic of another age with his guests exhibiting it with enthusiasm and commendable pride.

The verdant lawn has winding walks leading through the fragrant shrubbery. It is a *parterre* of beauty. There are rare flowers—many of them are exotics. These are bursting into blossom on every hand. Birds are singing amid the branches of the trees. The mansion which crowns a gentle knoll, several rods from the main entrance, is of moderate size, comfortable appearance, and is the residence of the superintendent of the Cameron farms. Rooms are reserved for Mr. Cameron and family, who frequently come out in the

summer to spend a few weeks in the leafy bowers of perfume. In this lawn are the various conservatories, or hot house which furnish vegetables and flowers for the use of the owner at the colder seasons of the year. These are not only sent to the city residence, but quantities are weekly forwarded to the princely Senate at his residence at Washington. It was tempting to behold the luscious strawberries as they hung upon their stems, richly hued as in June, large and inviting while Boreas reigned without and overcoat were buttoned close up to the chin for comfort. It was equally disappointing to moderate purses to learn that at this season the price in the Washington market was \$7.50 per quart. Then there were cucumbers eighteen inches in length, and said to be of an exquisite flavor, delicious to the appetite of even an epicure. Peaches for which only a few days remained to give them maturity. We shall not pause to describe tropical fruits, abounding here. There were palm trees. We saw the tree from which Indian rubber is made. But we must not delay to describe these exhibitions of the luxuriance of the vegetable kingdom. It is a wilderness of bloom and beauty all under the most careful and vigilant culture, and regaling the senses with rare and costly odors like the spicy breezes which "blow softly o'er Ceylon's Isle."

There was one natural curiosity which I greatly admired. The plant proclaimed the workmanship of the infinitely wise God. It was an artillery plant. The gardener submerged it in a fountain of water. In a few moments myriads of buds burst with a faint report. Each bud was enveloped in a cloud of smoke as it burst. To watch it as these buds followed each other in rapid succession, was to me exceedingly interesting. There was the fascination of actual warfare. Here was a miniature battery. There were blazing mortars. To describe this charming engineery is impossible. It was one of the freaks of nature. Doubtless these discharges of the plant in the soil of its nativity are to scatter its seed for like harvests.

But the reader may already be asking himself the question why a description of the lawn of Mr. Cameron should find a place in the history of the Pennsylvania Steel Works. To the writer of these pages it seems exceedingly appropriate. It is so because the lawn is open to visitors and the citizens of Baldwin frequently visit it. And this habit suggests a still further reason. Perhaps the time is near at hand when the United States Armory once destroyed at Harpers Ferry will be rebuilt in the meadow opposite the lawn.

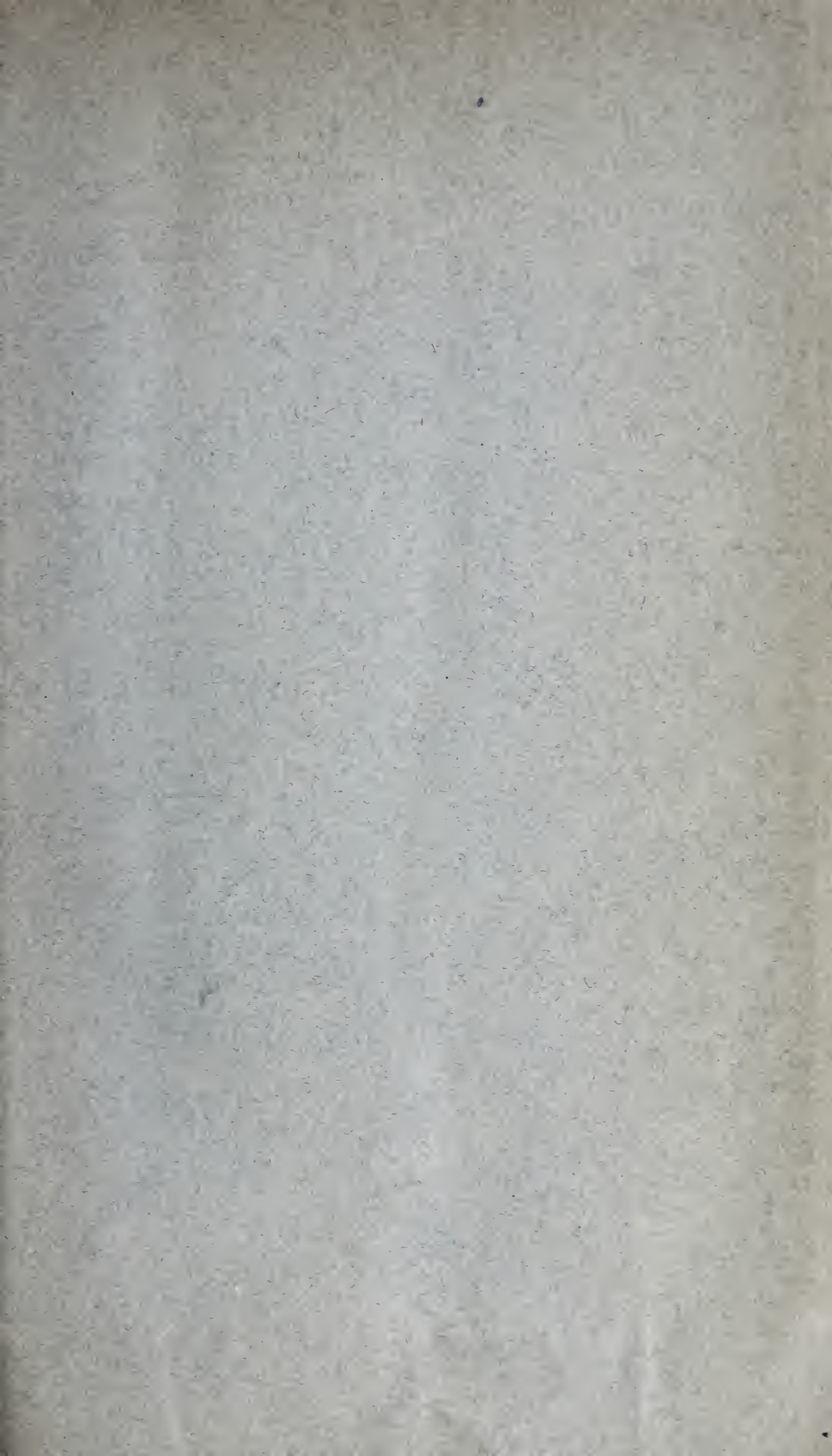
We predict that in the celebration of the nation's second centennial Baldwin will contribute an enviable share. There may be another name, but the scope of territory embraced by our humble history will then be covered by a population of a hundred thousand people, or more. This result is according to the inevitable logic of events. There is in the future the swing of conquest. These surrounding hills will be occupied by elegant mansions. The adjoining country will be adorned by villas of wealth. And above the town the smoke of factories will curl into the heavens. The streets will throng with operatives each evening returning from their day of toil. There will exist public libraries for the accommodation of the multitudes. The local postoffice will disappear and uniformed postmen will deliver the mails at the doors of citizens. There will be the tinkling bell of the horse-car. Day and night will echo to the policeman's patrol. An advanced civilization will proclaim itself in the shrill cry of the newsboy. We think we are not too sanguine of the future. A great statesman, standing on the summit of the Alleghenies, said: "I am listening for the tread of the millions who shall occupy this beautiful expanse of country." And so we, in sight of this landscape of wondrous loveliness—the distant hills bright with spring tints of forests

and foliage—the cultivated acres of fertile farms—the sunshine shimmering upon the ripples of the broad bosom of the Susquehanna—the marvelous possibilities which are here under the inspiration of capital, and the guidance of enterprise—we, too, listen for the footsteps of the approaching millions. The future of Harrisburg and Baldwin are, therefore, indissolubly united. The intervening spaces are already occupied by dwellings. They will thicken and multiply with the roll of years.

But we must pause in this study of local history. There are other duties pressing upon our attention. These pages have been written amid the rush of pastoral cares and at odd moments. They have far exceeded in length the proposed limits. While we have given descriptions of an earthly city our thoughts, too, have been on another city where there are neither furnace fires nor night, and the inhabitants are never weary. We have to our imagination pictured that city whose foundations were laid in the death of the first form of the universe. Its spacious walls are uncovered in the vision of John, its parks, its palaces, its rejoicing citizens, its perpetual beauty. In this city of God may we rejoice forever. In those heights may we be permitted to review the history of this world!

“ Beautiful Zion built above !
 Beautiful city that I love !
 Beautiful gates of pearly white !
 Beautiful temple, God its light !
 Beautiful trees forever there !
 Beautiful fruits that always bear !
 Beautiful rivers gliding by !
 Beautiful fountains, never dry !
 Beautiful light without the sun !
 Beautiful day revolving on !
 Beautiful worlds on worlds untold !
 Beautiful streets of shining gold !
 Beautiful heaven where all is light !
 Beautiful angels clothed in white !
 Beautiful songs that never tire !
 Beautiful harps through all the choir !
 Beautiful crowns on every brow !
 Beautiful palms the conquerors show !
 Beautiful robes the ransomed wear !
 Beautiful all who enter there !
 Beautiful throne for God the Lamb !
 Beautiful seats at God's right hand !
 Beautiful rest, all wanderings cease !
 Beautiful home of perfect peace !





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